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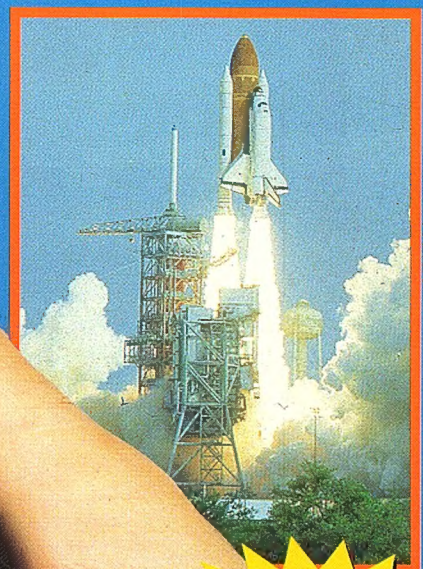

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8 **REVIEW: UNIDEN UH099 SUNDOWNER**
Ken Reynolds puts Uniden's new UHF Selcall CB under scrutiny.

SCAN — AND *WORK* — THE SPACE SHUTTLE
The space program gives radio buffs some great opportunities. A chat to outer space? Why not!

21 **ANTENNA REVIEW**
Australia's Benelec takes on the world with its new scan antenna.

22 **REVIEW: EMTRON DX-2**
Emtronics has been working on Australia's first *big* HF linear for some time. Was the wait worth it?

27 **REVIEW: ATS 818cs**
The ATS 818cs is an HF comms receiver most anyone can afford. This month you can *win* one too!

29 **OUR FIRST WINNERS**
Did you win the prizes in our first competition? Find out here...

37 **ANTENNAS: THE G5RV**
How do you improve on an old soldier like the G5RV? Steve Ireland's been burning Perth's midnight oil to tell you how...

44 **REVIEW: MFJ MORSE KEYBOARDS**
A bit wobbly with the old key? No worries, just *type* your message in!

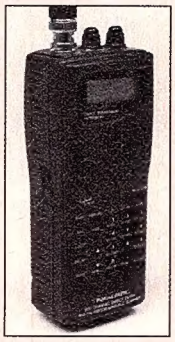
49 **RE PG4**

Here's s novel. GM affordable ne pocket pager responds to your UHF CB signals! Fo the op on the go...

52 ***MEGA*CYCLES**
Ken Reynolds, VK3TVS, recounts the true story of the 11 metre amateur-turned-CB band

66 **DELTA TANGO CLUB**
The Poms have established a new CB club set to take on the giants.

68 **REVIEW: REALISTIC PRO-62 SCANNER**
The latest in a proud line of hand-held scanners, the all-new PRO-62 is far more sophisticated than any of its forebears...



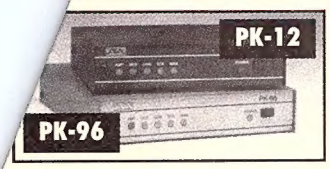
72 **LONG HAUL DX — ON A SCANNER?**
Yes, you *can* pick up the DX on a scanner. Scan freaks Jason Reilly and Michael Evans tell you how.

82 **IMPORTING RADIO GEAR**
What may look like a very cheap overseas bargain may turn into a huge headache. Read this first!

COMPETITIONS!
Win another four great prizes —
see pages 28 and 86

Watch out for our next great issue — it's out September 27!

5	Editorial	60	Here and There in Amateur Radio
18	Weather Satellites	62	DX & Band and IOTA
32	Modifications worth knowing	74	Shortwave Listening
34	Online – Communication Software	79	'Baudwalking' – the Internet
40	Packet Racket	84	IPS Propagation Charts
42	'In Flight' – Air Band information	86	DX Update
54	Gone Tropo	88	ACBRO News and Clubs
56	Hot Frequencies – for the Scan Fan	91	Classified Adverts
58	11m DX International	96	Amateur Repeater List



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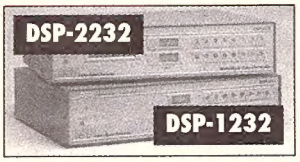

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- DSP-2232 features front panel LCD.

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- Dual simultaneous ports.
- Automatic signa identification.
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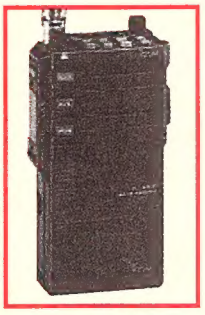

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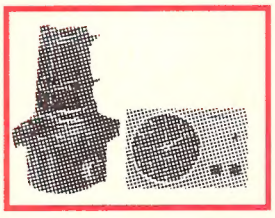

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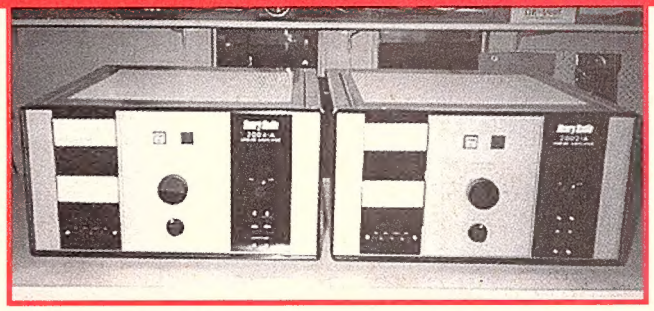

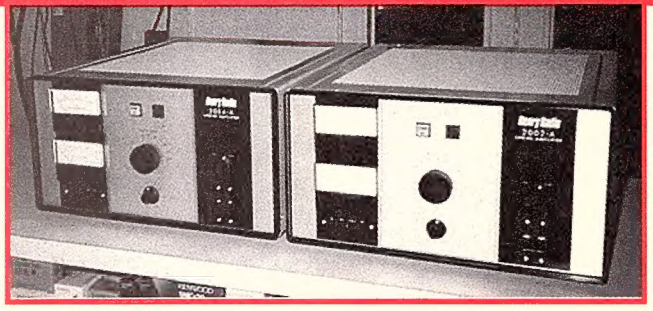

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Editorial Comments...

...and so we move onto issue number three and, as we do, there are a few things which deserve a mention.

Overall, the reception of R&C has been excellent, for which we thank you. However, as is only to be expected there are a few unhappy punters out there.

We knew when we combined ARA with CBA that we were not going to be able to keep everyone happy all the time, and striking a happy balance between the many facets of hobby-communications was always going to be the difficult part of the production.

We look to have got it pretty right, as 95 per cent of reader feedback has been extremely positive — but what of the other five per cent?

Well, basically this unhappy five per cent felt that their particular interests had been ignored in favor of someone else's interests. A few amateurs complained that CBers got too much editorial, while the CBers complained there was too much for amateurs. The scanfans, of course, complained about both the amateurs and CBers...

Being completely realistic, it's just not possible to have an equal balance of the hobby's many areas in each and every issue — nor was it when we published ARA and CBA as separate magazines. ARA readers used to grizzle that Packet radio got more than did slow-scan TV while Packet people thought that HF DXers got far more than they should. On the other hand, some CBA readers felt than scanning information shouldn't be included, while a few 27MHz operators had a problem with UHF rig reviews.

Some readers want construction articles while others don't — and so it goes on.

Our intention when we combined ARA with CBA was to continue to bring readers of those magazines the same type of editorial they were used to — plus a lot more.

I doubt that anyone can seriously say that we have not achieved that aim. We did not intend R&C to be an 'amateur' magazine, a 'scanning directory', an 'equipment catalogue', a 'CB rig review' monthly or a 'build-it-yourself' journal — but rather an up-to-date hobby-communications publication with something for everyone.

Over a period of time you will find that everything balances itself out with no special favoritism being shown to any particular interest... and yes, there will be construction articles... but not in this issue.

Probably more important is the fact that our readers have the chance to discover areas of communication that many don't even know exist. Many have been so involved in their own particular interest that they have never bothered to think about the enjoyment (and excitement) of broadening their horizons.

In this issue Bob Bell tells you how and where to listen to communications traffic between an orbiting shuttle and Earth — and you can take my word for it that this is one *helluva* buzz. Think about it — you can listen to an orbiting astronaut talking to an Earth station in real-time (live, that is) — and if that doesn't equal working DX or listening to aircraft on a scanner then my name is Arthur Tunstall. For limited, intermediate and full call licensed amateurs it gets even better — they can *talk* to astronauts in the orbiting shuttle!

Hobby-communications is a huge and wide-ranging area and it is simply not necessary, nor sensible, to confine your interest to just one small segment of the hobby.

The current sunspot situation means that HF propagation is just about as bad as it's going to get and, while there is still plenty of DX around for those stations properly equipped (and given a high degree of patience by the operator!) the fact remains that you're not going to turn on your rig and be assured of a good DX contact whenever you feel so inclined.

Now this problem is common to both amateurs and CBers, so why not spend some time getting to know other modes and types of communication rather than just sit and grizzle.

If you want a bit of a challenge give some thought to building up, or buying, the equipment necessary to capture weather satellite images — you sure don't need to be an amateur to enjoy this particular facet of hobby-communications nor do you need to be an amateur to view RTTY and Packet signals — although you do, of course, need a licence to send such signals.

Decode CW (Morse code) signals — via a demodulator and your computer if that helps — or chase the multitude of unencoded signals used by the military, police, fire brigades and whoever around the world on your communications receiver and/or scanner.

Intercept satellite TV signals and local outside broadcast signals — if you're lucky you even get to see episodes of the Simpsons and many feature movies weeks before they are shown on your local TV station... and you don't need to join pay-TV to do it.

Incidentally, for any subscribers having problems with late delivery can I ask you to please contact the subscription department on toll free number 1800 25 2515 and tell them — not the PBE (poor bloody editor) who merely puts the magazine together... thanks.

Coming up in the next couple of issues are the long-awaited new 'ground-breakers' — the Icom IC-706 and Alinco DX-70, and a whole lot more for *all* of you...

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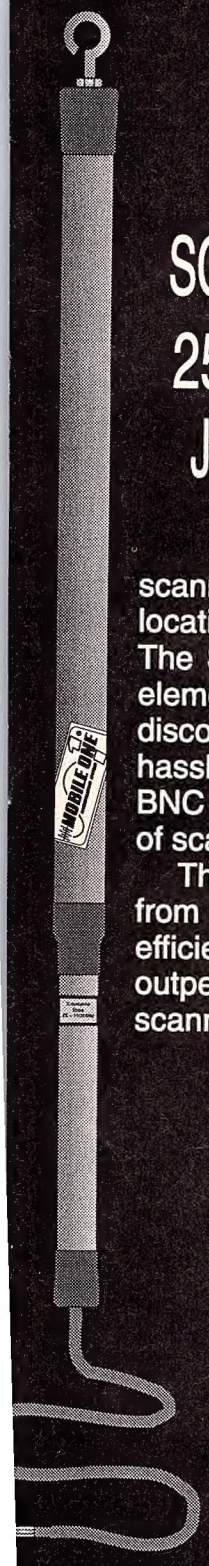

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Uniden UH-099

A new UHF CB with fully-programmable Selcall

By Ken Reynolds, VK3TVS

In a move plainly aimed at capturing some of the high-end UHF CB market from Electrophone, Uniden grafts a new LCD window into the face of its favorite black CB radio engine housing, integrates a sprinkling of programmable Selcall features and calls the new model UH-099.

General features

Uniden's new UH-099 UHF CRS transceiver is a revamp of the popular UH-series box of tricks offering 'more of the same' in a mobile transceiver but with the addition of fully user-programmable five-tone Selcall and a new liquid crystal display sporting variable back-lighting.

The strong, pressed steel frame and case is now a CB radio cliché, having served Uniden well from its beginnings in UHF CB more than a decade ago.

Uniden now has three current UHF CB mobile transceivers in its UH series, spanning the market spectrum. All models are very similar in appearance, sharing most of the same design engineering, but with additional features which increase with the model number and price.

The front panel appearance of the UH-099 is similar to previous models, with the exception of a new liquid crystal display insert which replaces the older LED module. Three of the six rectangular press-buttons now serve as double function controls, having features added to provide access to the new integrated Selcall system. On the rear panel the standard layout of DC power socket, antenna connector and external speaker jack also remains unchanged. As well, the not-so-old bulbous black microphone carrying the tone call press-button is also along for the ride.

Mounting hardware supplied with the UH-099 still consists of a rather crude, passivated steel bracket (the usual mount) bent to right angles at each end and carrying enough pressed holes to secure the bracket, but hardly the grip required to firmly mount the transceiver. The bracket has not evolved since the beginning of CB and is badly in need of an update in keeping with the technology it is supposed to safely support.

Selcall and tone squelch

Uniden calls its tone-calling system 'tone squelch'. There always seems to be some confusion when naming a tone call feature for UHF CB in Australia. On the older Uniden models (UH-001, UH-007, UH-011 and UH-077) the tone squelch function was ambiguous and either **Selcall** (Selective Calling) or **CTCSS** (Continuous Tone-Coded Squelch) systems could be fitted according to a user's requirement.

In the UH-099, however, the tone calling system is definitely Selcall (according to our definition) and the usual escape route is closed. While both systems have some fundamental similarities in that they use audio tones to open a transceiver's squelch, the functions are quite different and should not be confused with each other. In fact, in many commercial applications *both* tone calling systems are used simultaneously. CTCSS uses a continuous background audio tone which is sensed by the receiver decoder and causes the squelch to open and remain open until the tone is no longer detected.

If you are a five-tone Selcall user on UHF CB, or you aspire to be such an operator, no longer will you need to depend on external forces to personalise your Selcall codes. With the UH-099 UHF mobile transceiver, by consulting its comprehensive instruction manual, you can be totally independent and do it all yourself.

Not only does the user have full control over the five transmitted Selcall tones (and all its variable parameters, including tone-period and lead-in delay) but the receive code can also be set by the operator. While full autonomy is the freedom that many desire, the ability to fully control one's own destiny has unexpected traps and pitfalls for the unsuspecting... and roll-your-own Selcall is no different.

Many operators are confused about the operation and various features of Selcall and, since Uniden has clearly let the cat out of the bag, this review is probably a suitable forum to clear up some of the mysteries and misconceptions.

About Selcall

For those readers who might not be acquainted with Selcall, a few basics to get started:

Selcall, an anagram for **Selective Calling**, is a bit like having a five digit phone number for your radio, but instead of being connected to a telephone line you are dependent on a radio.

Five-tone Selcall is the most common standard used these days and, much like telephone dialling, each digit is represented by a different audio tone. In the telephone system the number you dial is recognised by the telephone exchanges and the call is routed to its known destination by a huge network of interconnected wires. So, although you have an individual phone number for each telephone subscriber, it is the network that recognises where to send the call and not the receiving telephone itself — except with cellular phones, where the similarity to radio Selcall operation is quite strong.

With radio Selcall it is the individual radio receiver's responsibility to constantly monitor a selected radio frequency and instantly recognise its own possibly unique set of tones. I say *possibly* unique, because sometimes more than one radio is programmed to recognise the same call number and this can lead to confusion and annoyance for more than one user. Fortunately, this does not happen too often and it can usually be easily corrected.

Selective Calling is often misrepresented by some questionable sources, and readers should not be misled into believing it can offer a 'private' channel. Selcall simply provides an efficient signalling system which enables a user to operate his or her receiver in a standby, muted condition without the tedious strain of monitoring all radio traffic on a selected channel for a familiar call sign. The radio does all the hard work for you. It maintains a continuous, quiet vigil, sampling every audio tone or toneset on the selected channel, rejecting all but its own unique five-tone sequence.

The Selcall tone burst is constructed like this:

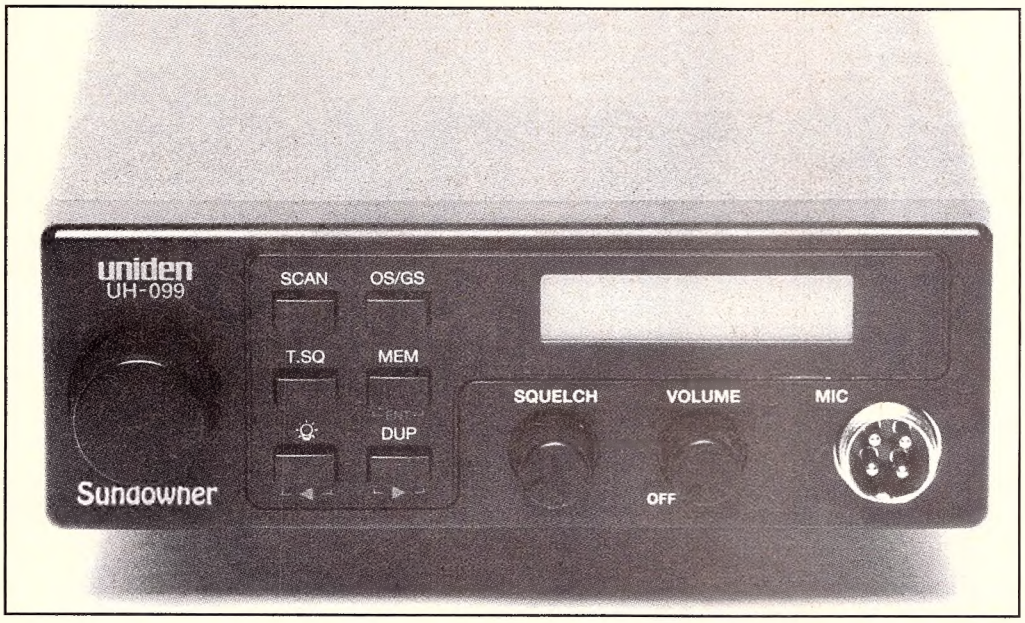
1. **Lead-in delay**. This is a short period of blank carrier signal which allows time for a sluggish mute (squelch) on a receiver or repeater to 'break' open in readiness to decode the tone burst.

Lead-in delay can vary from zero to several seconds in length. Most systems use 500 milliseconds (one half of one second) for this time period.

2. **Lead-In Tone** is required by some Selcall configurations to assist in the detection of a special function. The GME TX-4000 employs such a lead-in tone.

3. **Tone Set** is the group of specific audio tones used by a variety of world-standard tone signalling systems. The main standard used in Australia is known as the CCIR standard, however there are half a dozen different tone sets which have industry recognition. The numbers through 0 to 9 are represented by individual tones plus one extra tone represented by the letter 'A' that signifies a Group Call.

4. **Tone Period** designates the length of each tone in a tone burst sequence. There is some mixture of tone periods used in Australia. While 40 milliseconds duration for each tone is now the most accepted standard, many older Selcall systems were a bit slow to detect and identify individual tones, so they frequently used tone periods



of 100 milliseconds.

Two important functions of Selcall are **Alarm** and **Auto-acknowledge**.

The **alarm** function is designed to alert the called station that a call has been received. This usually takes the form of a 'beeping' audio tone sent to the loudspeaker of the called radio. It can usually be set to be self-cancelling after a short period or left as a permanent alert producing a 'beep' every few seconds until the call is answered by the operator.

Auto acknowledge is a very handy feature which causes the called transceiver to 'snap' into life on recognition of its Selcall number and reply with a short tone-modulated transmission, thus confirming to the calling operator that they have 'got through' and that the called station will reply when the operator is available. Sometimes the called operator hates Selcall and doesn't want it known that he or she is even listening at all... but too bad! You've been sprung.

Anonymity...

And on that note we will return to the UH-099, which has most of the above features available to the operator as programmable functions... except you don't get sprung if you are listening with the Selcall feature deactivated. Hmmm...

On all the other Selcall systems we have encountered up to date, the alarm and auto-acknowledge features are always active in a 'background' mode and, regardless of the selected receiver function, if a Selcall burst is recognised by the receiver it will trigger the Alarm and Auto-acknowledge functions, although these facilities can be usually deactivated if desired.

The UH-099 responds *only* if the Selcall function is activated. Is this a good feature or not? Users will have to be the ultimate judge of this function. Is it most important to know when you have been called, as an overriding function, or does one wish to 'sandbag' with anonymity? I'm for the subliminal feature.

No self-ID

The UH-099 does not use a self-identifying tone burst like the GME product, so you won't find your Selcall number displayed on a TX-4000 LCD. Again, this may or may not be a good feature. This is a highly subjective feature, and it really depends on an individual's personal point of view. The UH-099 is unique in UHF CB for more reasons than its fully-programmable Selcall features. Take a look at the LCD window reproduction shown in **Figure 1**. Apart from all the expected features of channel display, S-meter and other general advisory decals, in the lower left hand corner of the window, a bank of seven segment digits display the selected channel frequency in Megahertz. That's maybe a good idea, eh?

What's inside?

While the external view of the UH-099 is familiar is size, shape and color, the internals have been revolutionised and a brand new main circuit board has been produced.

The circuit board is made from tough, resilient fibreglass with printed wiring on one side only (single-sided) with a carefully laid-out network of wire straps on the top side to substitute for the second side's printed wiring. Uniden must still find it

....☞

FRONT PANEL INDICATORS **Figure 1.**

TX INDICATOR (TX)
The 'TX' and 'RF' icons appear during transmission.

CAL INDICATOR (CAL)
The 'CAL' icon appears when an incoming tone code successfully opened the Tone Squelch, or when TX SELCALL codes are being transmitted.

MEMORY INDICATOR (MEM)
In the normal mode (Scan Mode Off) the 'MEM' icon appears when the channel indicated by the CHANNEL INDICATOR is programmed in the selected scan memory.

DUPLEX INDICATOR (DUP)
The 'DUP' icon appears when the Duplex Channel Operation is selected.

SIGNAL/RF LEVEL INDICATOR
Indicates the relative signal strength level (S) when receiving, or the relative TX power (RF) level when transmitting.

TONE SQUELCH INDICATOR (TSQ)
The 'TSQ' icon appears when the Tone Squelch has been activated.

OPEN SCAN INDICATOR (OS)
The 'OS' icon appears when the Open Scan Mode is selected.

GROUP SCAN INDICATOR (GS)
The 'GS' icon appears when the Group Scan Mode is selected.

SCAN INDICATOR (SCAN)
The 'SCN' icon appears when Scan is activated.

PRIORITY INDICATOR (PRI)
The 'PRI' icon appears only when in GS Mode and Scanning, either when the PRI channel becomes active or when the channel knob is rotated to select a new PRI channel.

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Uniden UH-099

(Continued from previous page...)

cheaper to insert wire straps than produce a double-sided circuit board with plated-through holes... In some ways, this assembly concept might be easier for service personnel to follow the circuit layout if repairs are ever needed.

The top side of the circuit board, like many other newer rigs, appears bare since most of the smaller components like resistors, transistors, capacitors and the like are now found on the board's underside as lead-less, surface mount devices which occupy only a small fraction of the space required for the older 'pigtail' through-hole insertion components.

The board layout is neat and tidy and, as is usual for Uniden, it is mounted securely with machine-threaded fasteners. The Selcall tone board appears as a small 'daughter' board mounted perpendicular to the main board, and is soldered to it at one end. For 'fiddlers', all the preset controls are labelled clearly so there is no reason to stuff up the alignment finding out which twiddly thingy does what. We expect good reliability from this style construction.

Interference... a new player

On my usual jaunt around the RF 'hot-spots' of Melbourne the UH-099 performed as anticipated, suffering quite strong interference similar to most other UHF receivers we have tested.

This trip however, I discovered a new source of interference emanating from, or near to, some cellular phone terminal sites. Whether or not there is a new player in the UHF interference game I am not quite sure, but it bears further investigation.

If we get time to test some other rigs under similar conditions before the next issue we may run a short report detailing the observations.

Performance

Scanning

The receive channel-scanning feature is identical to the UH-077 and consists of two user-programmable scan groups into which the operator can, at the touch of a button, enter or remove channels from the active group.

Scan as many or as few as you like... it's up to the user. The squelch trigger circuit is very sensitive, and even weak stations are easily caught by its lightening-fast response.

Receiver characteristics

Receiver sensitivity for the UH-099 is good, but not earth-moving. The review transceiver measured 0.26µV (microvolts) for 12dB SINAD, which means not *too* much should get away from this rig. Note, however, that some of the portables are doing noticeably better.

The variable squelch circuit has 'nice' soft characteristics with adequate hysteresis and the minimum limit setting opens at about 0.1µV and at the high end a modest signal level of 1.0µV is needed to trigger the speaker into life.

Measured performance of the bargraph S-meter was as follows:

Indicated Strength	Level in Microvolts
1	0.21
2	0.35
3	0.25
4	0.80
5	1.80

The meter is easily read and is not pretentious about its calibration. However, like most similar style indicators for UHF CB, the scale is badly compressed and bears little resemblance to the range of signal strengths likely to be experienced on the band.

Selcall response

The Selcall reliability is fast and precise, and during our tests we were unable to produce a false response even with badly over-deviated bursts of similar tones. The decoder was able to reliably recognise a call tone burst partly masked by background noise.

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Beam your scanner into space...

with the US Space Shuttle and MIR!

By Bob Bell, VK2UTG

As Captains Kirk and Picard say in the introduction to *Star Trek*, "Space (is) the final frontier". And that's probably why so many people, from all walks of life, get so excited about the space program.

For anyone interested in radio communications, this situation is perhaps magnified many hundreds of times, because without radio communications there would be no space program!

Most everyday people are interested in things to do with space travel, but they never get the opportunity to do what *we* do: to eavesdrop on space flights while they are happening and, on occasions, to actually speak live to the astronauts and cosmonauts using amateur radio equipment during their stays in space.

It doesn't matter a hoot which particular program you're interested in — the United States space program, or the Russian MIR space project. They both offer the radio enthusiast maximum excitement. There are some in our hobby who chase nothing else but the communications from the Space Shuttles and MIR!

Since the end of the Apollo project, which encompassed the moon landings, the United States Space Shuttle is currently the vehicle at the center of the United States space program. The Shuttle has meant a great deal to radio enthusiasts, as it offers a selection of frequencies low enough to monitor on scanners and communications receivers, using minimal antenna installations.

During the 1960s, the Project Mercury UHF radio frequencies were in widespread use. Since 1974, and the birth of the Space Shuttle program, they have been resurrected and given a dedicated role within the STS (Shuttle) missions. These frequencies, 296.8MHz (primary), 259.7MHz (secondary), and 279.0MHz, are used in combination with the worldwide military UHF distress frequency 243.0MHz, which to Space Shuttle crews is referred to as the 'guard' channel.

The United States Space Shuttle vehicles primarily communicate with their Mission Control (located in Houston, Texas) utilising a system of two communications satellites deployed deep in space, known as **TDRS**. This stands for 'Tracking Data and Relay Satellites'.

The main frequency in use by the Shuttle vehicle for this purpose is 2287.5MHz, with digital, wideband, multiplexed transmissions in the S-band. In addition, 2250.0MHz, also in the S-band, is used to relay Shuttle engine telemetry data and television video to earth, while orbiting.

The TDRS satellites are above 41 degrees West and 171 degrees West, and both these 'birds' can see the White Sands Earth Station in New Mexico, USA. The only real TDRS 'blind spot' is a large area over India. In normal situations, the Space Shuttle sends S-band data, video and audio to whichever TDRS is within its 'view'.

S-band frequencies for the Shuttle are: 2287.5MHz (downlink), 2250.0MHz (downlink), 2217.5MHz (downlink), 2214.0 MHz (downlink), 2205.0MHz (downlink), 2106.4MHz (uplink), 2041.9MHz (uplink), 1831.8MHz (uplink) and 1775.9MHz (uplink).

Just as a matter of interest, in the early 1970s, American amateur radio operators K2RIW and W2IMU got their heads together and built a stressed 3.65 metre dish with which to receive Apollo lunar landing missions on 2287.5 MHz. Yes, that frequency was also the primary S-band Apollo channel!

The 148 dB gain parabolic antenna was highly efficient, and allowed these trail-blazing and resourceful amateur radio operators to tune into all the juicy material spoken about by the Apollo astronauts that NASA didn't want the media to latch onto. Check out the August 1972 edition of *QST* magazine, and you'll see this 'before-its-time' parabolic antenna they constructed to listen in on Apollo and Skylab signals!

Back to the Space Shuttle... The Shuttle also has a Ku-band capability, with frequencies around 15.003GHz, being a high-speed digital datalink, beamed to NASA relay and tracking stations. This 15 GHz link is not able to be received on any conventional monitoring equipment now in the hands of enthusiasts. The link actually has numerous channels, which can either be used for voice or high-speed telemetry.

So, I can hear you asking, if the Space Shuttle Program has all these higher microwave frequencies for voice and data, when are the old Project Mercury UHF frequencies utilised to-and-from the Shuttle vehicle during missions? Good question! Basically, UHF primary and secondary frequencies are used when the Space Shuttle is out of range of the main S-band facilities, or when S-band channels are for some reason otherwise tied up. UHF frequencies are also utilised during two very important and critical phases, the blast off (launch) and landing phases. UHF is also used exclusively during space walks.

During their space walks, Shuttle astronauts use what they call the 'mode' system, where they select either MODE A or MODE B on the communications selector panel in their space suits, depending on what other astronauts involved in the space walks are utilising. For example, if one Shuttle Astronaut selects 'Mode A' to transmit, and 'Mode B' to receive, another astronaut also involved in the walk will select 'Mode B' to transmit, and 'Mode A' to receive, and so will achieve a 'full duplex' circuit between the space walkers and the Shuttle vehicle. They all transmit continuously, except in a situation where they use another mode, known as 'BACKUP', where the communications are simplex, and use is made of press-to-talk (PTT) switches.

Let's have a closer look at the Space Shuttle UHF allocations. All frequencies are in MHz:

SHUTTLE	MODE A	MODE B	BACKUP
296.8 (T)	259.7 (T)	279.0 (T)	259.7
259.7 (R)	296.8 (R)	296.8 (R)	296.8
279.0 (R)	279.0 (R)	259.7 (R)	296.8

Other frequencies that have been monitored away from S-band or Ku-band are 136.8MHz, which is designated 'IUE', the international ultra violet Explorer frequency, 140 kHz (low frequency) for crew communications, and 200 kHz (wall-mounted transceivers).

Each of the high-tech and highly expensive astronaut's space suits employ within their communications system a biomedical telemetry frequency, which operates as a subcarrier 5.4 kHz distant from the main audio, using wideband FM. This subcarrier provides ground controllers with detailed data on the space walker's heart rate, respiration and the like, and also provides accurate information on peripheral matters such as the inside-suit temperature.

What power settings are used by space-walking astronauts from the Shuttle, as the Space Shuttle orbits between 100 to 200 nautical miles above the earth? It's very minute — 250 milliwatts, in fact. Each flight in space is different, with orbits set at varying distances from the earth, depending on the tasks the Shuttle astronauts have to perform in space. Sometimes, the distance is increased for a special reason. For example, when the Shuttle was sent to repair the Hubble Space Telescope (which had a badly out-of-focus lens element) the orbit was increased to 320 nautical miles.

Regardless of these distances, and the very low power settings used, you can still (as a monitor) receive excellent audio from the shuttle UHF system. Some monitors are using elaborate antenna systems to maximise their chances of good 'copy' from the Shuttle, but others are using hand-held scanners with nothing more than their rubberised antennas to hear good audio when the Shuttle is directly above them!

There are a number of excellent computer programs available which will accurately predict the length of orbits and tell you when the Shuttle will next appear over your particular location. But if you haven't got access to a computer or these specialised 'tracking' programs, no worries — you can still stay on top of the situation and monitor the Space Shuttle competently using some simple techniques.

Getting started...

Leave all the Shuttle UHF frequencies programmed into your scanner for the entire duration of the mission you wish to monitor. Lock out all other channel positions. The Shuttles, like all space vehicles that are orbiting the earth, display a 'doppler effect'.

As they drop over the edge of the world in relation to your location, communications from the vehicles will get rapidly worse, and will eventually disappear. When the Shuttle next begins to travel overhead your location, it 'appears' from over the horizon. As it gains 'line-of-sight' with your receiving station, communications from it are very receivable at your location, even on hand-held equipment. Basically, each orbit of the Shuttle lasts about 90 minutes, with the earth turning eastward one revolution every 24 hours, or 15 degrees longitude per orbit.

If you wish to do everything possible to maximise your chances of receiving excellent audio from the Space Shuttle UHF frequencies, a Log-Periodic beam tuned to frequencies between 250 to 300 MHz is the way to go. Or a wideband discone. My personal favorite is the **Oztennas Airscan** antenna, available from Oztennas in Melbourne on telephone 019 94 7524. The price is $130, and the antenna seems to work perfectly on military UHF, which the Shuttle frequencies are part of.

Now is the time to prepare yourself to monitor future Shuttle missions. I have spoken to Shuttle expert Donald Dickerson, a great friend of mine, from Indianapolis, in the USA, and he assures me that in upcoming STS missions there is a great deal of extra vehicular activity (EVA) planned to take place. And Donald has inside information that suggests that the 'EVA packs' which are encased within the space suits have no scrambling capability.

On Department of Defence missions, where US Military surveillance satellites are deployed by the astronauts, Shuttle S-band and Ku-band audio and video is encrypted. But, amazingly, the Shuttle UHF frequencies are always used 'in the clear'. Presumably, the low power settings are thought to be so low they don't constitute a threat to security. But you and I know better, don't we?

Donald Dickerson writes for *Popular Communications* magazine in New York and *Satellite Times* in North Carolina, as well as *Radio* magazine, published in Fort Worth, Texas. He holds the US amateur callsign N9CUE. That brings me to another Shuttle communications target for radio hobbyists — amateur radio.

The SAREX missions

In 1983, I actually spoke to Space Shuttle astronaut Owen Garriot, amateur callsign W5LFL, who was on board the Shuttle Columbia, on mission STS-9. The conversation was made possible by NASA encouraging astronauts who hold amateur licences to take their equipment aloft with them and talk to other amateurs during their free time periods during the missions.

When Owen Garriot spoke to me, I was using equipment as a 'second operator' at the Yagoona, NSW station VK2LZ, not at that stage having my own ticket. Owen confirmed he was using 2.5 watts from a Motorola hand-held radio, which had been set up with two metre frequencies. He went on to describe his 'strip-line' antenna, mounted along the Shuttle window. He also told me what the word 'SAREX' meant: Shuttle Amateur Radio EXperiment.

Owen Garriot's Motorola HT on which he spoke to yours truly had 'smart squelch' fitted. But the 'smart squelch' couldn't differentiate between genuine unwanted noise and the pile-up caused by 500 calling stations, all trying to talk at once. So, a lot of the time, the Motorola radio's 'smart squelch' just shut down. (My call was very lucky to get through, it would appear!) Owen realised what the problem was, and asked NASA to provide equipment featuring 'dumb squelch' on subsequent missions.

The Space Shuttles have used the same amateur radio frequencies since that mission — 145.550 (Shuttle TX), and 144.91 (Shuttle RX), 144.93 (RX), 144.95 (RX), 144.97 (RX) or 144.99 (RX). Over Europe, three additional RX frequencies were utilised, being 144.70, 144.750, 144.80 MHz.

To reduce the physical load of calling stations, the shuttle astronauts were able to select one of five input frequencies, so it was something of a lottery as to whether you'd be able to get through or not. The best way was to program all five in with different offsets, meaning you could switch from channel to channel, calling as you went.

But that's now changed. With STS-70 *and all subsequent missions*, an entirely new set of frequencies was selected. The reason for this was the Russian space station Mir, which uses 145.550MHz simplex for cosmonauts to chat to earth.

To avoid any potential mixups between the simplex and duplex stations, the SAREX working group introduced these new channels, and they apply right now: all downlink activity is on 145.84MHz, with two only uplink channels, being 144.45 and 144.47MHz. If you're an amateur and would like to work the Shuttle (and who wouldn't?!), all you need to do is program your two metre transceiver with two channels. Both receive on 145.840, but one has an offset of 1.39MHz while the other's offset is 1.37MHz. Consult your user manual to find out how to program these unusual offset frequencies!

During Mission STS-35, Astronaut Ronald Parise, who holds the amateur 'ticket' WA4SIR, was a 'Payload Specialist'. Ron works for the Computer Sciences Corporation, and NASA wanted

him on board to direct the computing operations on board STS-35.

In May 1990, a Heath Pocket-Packet system was installed on board the Shuttle vehicles. The frequency used for packet is 145.825 MHz. The frequency is still current.

Nowadays, packet radio and slow scan television (SSTV) are also transmitted by the space shuttle SAREX stations. When the joint USA/Russian Space Station 'FREEDOM' eventually becomes an orbiting reality, the crew will have a permanent amateur radio station on board. The station is being included in forward planning, taking place as I write this article. So, rest assured, after the shuttle, there are bigger and better things yet to come!

During Space Shuttle missions, the Goddard Space Flight Center, located in Greenbelt, Maryland USA operates an amateur radio HF station, with the callsign WA3NAN. This station is dedicated to the re-transmission of Shuttle audio on all non-Department of Defence missions, on the following frequencies: 3860, 7185, 14,295, 21,390, 21,395 and 28,650kHz. The 14MHz frequency is transmitted continuously, with 7185 relayed during USA daytime periods, and the 3MHz channel during USA local night periods.

If you have a communications receiver, and dial up these WA3NAN HF channels, also try tuning the US Air Force frequency 20,192kHz (USB mode), which is used by the Ascension Islands Tracking Station.

The air force chats with Cape Canaveral on this channel, and Ascension communicates with ships and aircraft stations relating to Shuttle missions on either 5190 or 10,780kHz USB.

Other HF support frequencies used during blastoff and recovery sequences are: 5810, 9002, 13,218, 13,480, 19,640, 19,990, 19,995 and 22,760kHz. All these channels have borne fruit for monitors over the years.

There are countless other frequencies that have been bandied around from time to time, in books, magazines, and on bulletin boards. None of these other channels have yet been proven to have been used during missions, and as such we are not going to run them, as I believe they will just confuse the issue. Stick with the channels that are proven monitoring winners for the space program!

The Russians are coming!

We've already touched on the USA/Russian joint Space Station now being planned and constructed. But what about orbiting cosmonauts, now in space, on board the **MIR Space Station**? Can you monitor them? The answer is Yes, yes, ***yes!***

In November 1988, MIR cosmonauts were given a Yaesu FT-290R two metre 2.5 watt all-mode transceiver, and a ground plane antenna was installed on an external surface of the MIR station. Cosmonaut Musa Manarov (callsign U2MIR) talked with amateurs all over the world, regularly, on a range of frequencies between 144 and 146 MHz. There was some packet radio equipment on board, but packet operations were fairly limited. (Actually, Musa wasn't quite sure how to use the TNC!)

After Musa had been aloft for many months, he began to get bored with voice contacts with amateurs on earth, and one female amateur operator offered to send him (by radio!) some packet programs he might enjoy playing around with. She just happened to be a Victorian primary schoolteacher named Maggie Iaquinto, VK3CFI, and her students developed a bond with Musa Manarov, by packet radio! She actually taught Musa about the finer points of packet in voice during the limited contact time-envelopes as the MIR spacecraft passed over her school.

When Musa's time in space was over, and he returned to earth, his Russian bosses asked him if there was anywhere he would like to go in the world after he recuperated from the effects of prolonged weightlessness. Yep, you guessed it, he chose Victoria, Australia, and actually visited his schoolteacher friend and the children who had regularly talked with him on the radio, both in voice and through the teacher's packet station.

While he was in Melbourne, Musa used a simple hand-held 2M radio to talk to his buddies hundreds of nautical miles above him in the MIR Space Station. These men had remained aloft on his return to earth, and now he was talking to them casually, on his Victorian friend's HT, as he stood surrounded by journalists in a Melbourne city street! A great story, which was truly magnificent press for our great hobby of radio communications.

In February 1991, the MIR station was upgraded somewhat, with the addition of an Icom IC-228A, with two power settings available, either 5 or 25 watts. They also were provided with a more modern PacComm 'Handi Packet' TNC, and a PC-AT laptop computer, giving them full packet capability. The Cosmonauts have a PMS (Personal Message System), where they can both receive and send E-mail with ground-based stations.

The Russian MIR Space Station, like the United States Space Shuttles, employs a satellite data relay network, this time known as 'SDRN'. There are actually two satellites, named 'Altair' and 'Luch', overhead 16 degrees West, and 95 degrees East. But the facts of the matter are that these two satellites are not used much, as MIR has to be physically re-oriented to communicate with them! The frequencies used as primary communications channels to and from the Russian MIR Orbiting Space Station are: 142.4MHz (the Salyut voice channel — still utilised), as well as 142.4175, 142.6, 143.144, 143.625, 145.55 (amateur radio primary), 145.575 (amateur radio secondary). The HF channel 20,983kHz is used for telemetry purposes. The S-band frequencies for the SDRN satellites are unknown at time of writing. A big Russian secret, but not really much of a loss!

In February 1995, Space Shuttle Discovery on mission STS-63 came within 10 metres of the orbiting MIR Space Station. In July 1995, the Shuttle docked with MIR, and after several days of interaction between the Shuttle and MIR crews, returned an American astronaut who had been aboard MIR, and several cosmonauts back to earth. Many communications interaction circuits were set up to achieve the docking and undocking operations. All the frequencies used were normal Shuttle and MIR S-band, Ku-band, UHF, VHF, and HF frequencies. There were actually 12 Shuttle/MIR communications loops:

LOOP 1 MIR-to-Shuttle
LOOP 2 Air-Ground for MIR (monitored by the USA)
LOOP 3 Ground Control loop
LOOP 4 Mission Control (Houston) Flight Director loop
LOOP 5 Russian Mission Control
LOOP 6 Simulation Supervisor
LOOP 7/8 Houston-Moscow co-ordination
LOOP 9 Shuttle Air-Ground S-band
LOOP 10 Surgeon's loop (privileged medical information)
LOOP 11 Public Relations co-ordination loop (schedules for interviews etc)
LOOP 12 Shuttle-MIR communications simulation (but VHF is generally used for Shuttle-MIR communications)

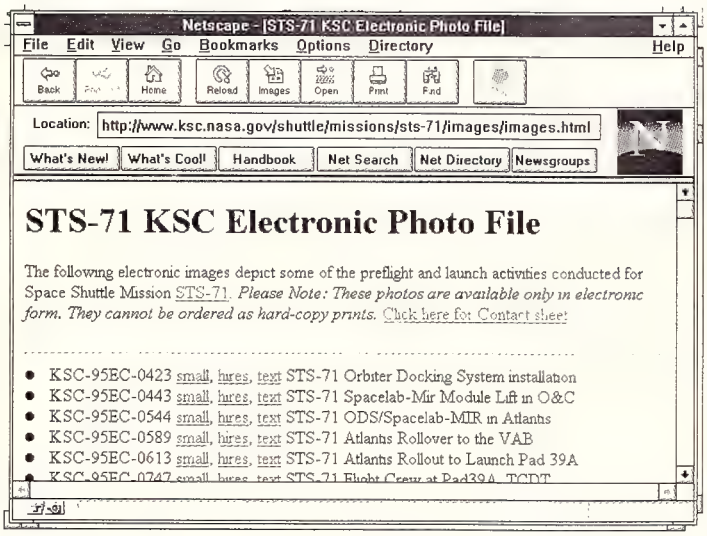
The VHF frequencies to monitor during Shuttle/MIR docking operations are 121.75MHz (FM) which is, of course, on the aviation band, but aviation uses it in AM mode, and 130.1625, which is a MIR frequency.

121.75 FM is a Soyuz ferrycraft frequency. The Space Shuttle communicates with MIR using a Motorola URC-200 military radio and broadband helix right-hand circularly-polarised 10dB gain antenna, located in the Shuttle cargo bay. The URC-200 is capable of transmitting and receiving on 115 to 173.9875 MHz, and 225 to 399.9875 MHz. There are three power settings available: 100 mW, or five or 10 Watts.

Looky here!

Okay, so far we've told you how to monitor audio from the Space Shuttle vehicles and space walkers and the Russian MIR crews, how to talk to them on amateur radio, and how to monitor Shuttle S-band transmissions re-transmitted on amateur HF fre-

There is a truly huge amount of information about space exploration available on the Internet. Try this: http://nasa.shuttle.gov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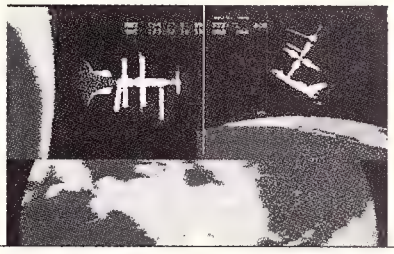
The following electronic images depict some of the preflight and launch activities conducted for Space Shuttle Mission STS-71. Please Note: These photos are available only in electronic form. They cannot be ordered as hard-copy prints. Click here for Contact sheet
KSC-95EC-0423 small, hires, text STS-71 Orbiter Docking System installation
KSC-95EC-0443 small, hires, text STS-71 Spacelab-Mir Module Lift in O&C
KSC-95EC-0544 small, hires, text STS-71 ODS/Spacelab-MIR in Atlantis
KSC-95EC-0589 small, hires, text STS-71 Atlantis Rollover to the VAB
KSC-95EC-0613 small, hires, text STS-71 Atlantis Rollout to Launch Pad 39A

Tracking Display



quencies.

But what about **vision**? NASA employs a satellite television transponder on C-band on IntelSat, overhead 180 degrees east (Pacific Ocean) beaming continuous Shuttle vision, with commentary overlay, and two-way communications between the Shuttle and Houston mission control. This satellite service is known as **NASA Select**. The service has frequently used the WorldNet IF transponder frequency of 1178 MHz.

You need an NTSC format TV monitor to watch the pictures in color, and you won't be able to record vision without an NTSC video recorder.

CNN (Cable News Network) from Atlanta USA also provides good coverage, usually live, of most of the more significant spacewalks by Shuttle Astronauts. CNN's C-band signals, which are also beamed from a 180-degree transponder, were at time of writing about to be encrypted.

So even if you have a C-band system, chances are you can't watch it on CNN direct any longer. But the local Ku-band television station interchange networks still beam a re-broadcast of CNN from C-band to local Ku-band, and you may pick up some useful CNN signals relating to Shuttle missions on Ku-band satellite television here in Australia.

CNN is on IntelSat (180 degrees East) on NTSC at 1220 MHz IF (domestic USA service) and 1305 MHz IF (CNN International). The best local Australian Ku-band transponder to watch is Optus B1, vertically polarised, transponder No 4, on frequency 12,456.7 GHz (IF 1156.7 MHz), in PAL format.

During local midnight to dawn in Australia, tune up Ku-band transponder No 132, from Optus B1, horizontally polarised, frequency 12,550.6 GHz (IF 1249 MHz), also in PAL. This interchange transponder is by day used by the ABC, and during the mid-dawn period, they pipe CNN International through almost continuously. Great value during Space Shuttle mission periods!

Space Shuttle missions are now turning around within days, rather than months or weeks. There's lots of radio communications to listen to and enjoy from out there, deep in space. Take note of the privileged information I have provided you with, and tune the frequencies and watch the television satellite transponders mentioned in this article. You'll definitely by that time be 'hooked' on space communications.

And after you become an 'old space hand', write to me at PO Box 16, Georges Hall 2198 and tell me about your best-ever Space Program monitoring experiences!

Welcome On Board STS-71

This is the maiden voyage of the official NASA source for World Wide Web information about all space shuttle missions.

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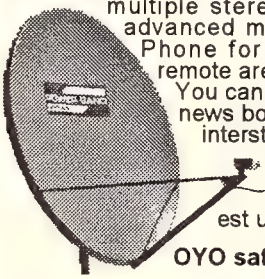

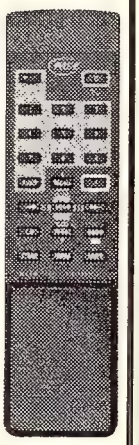

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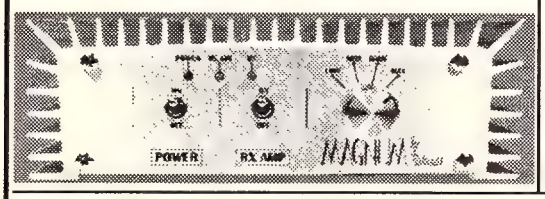

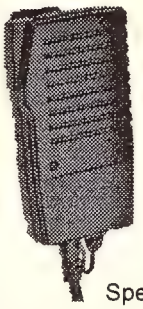

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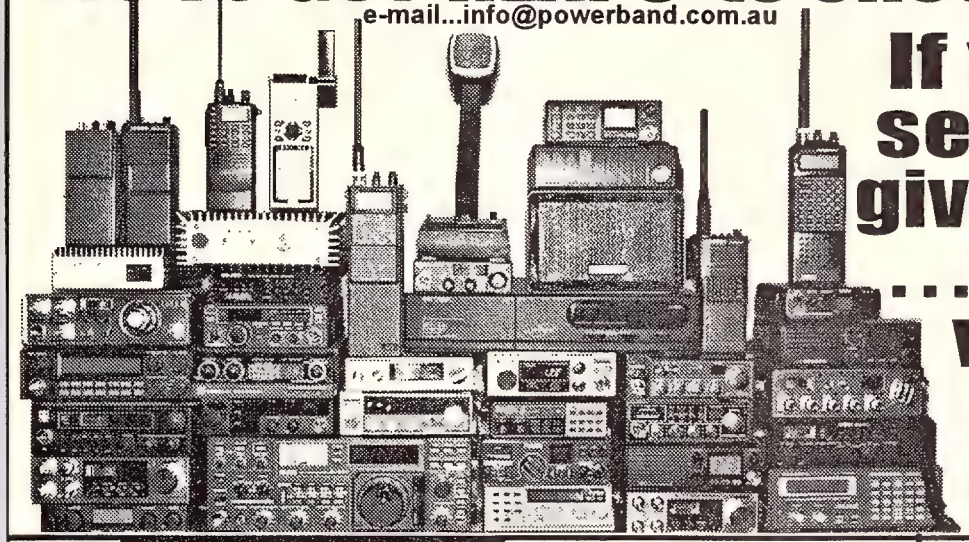

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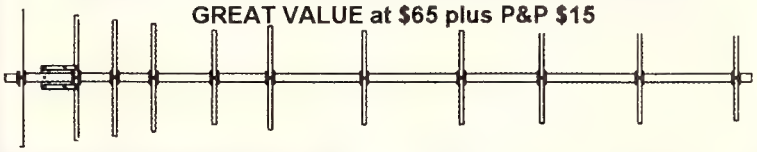

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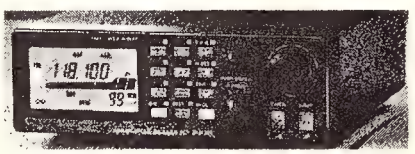

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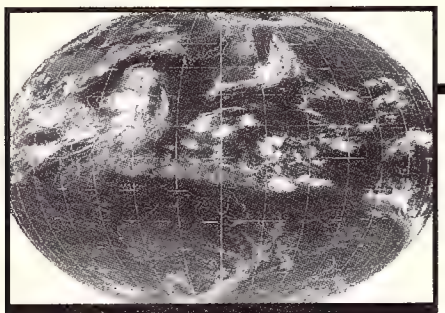


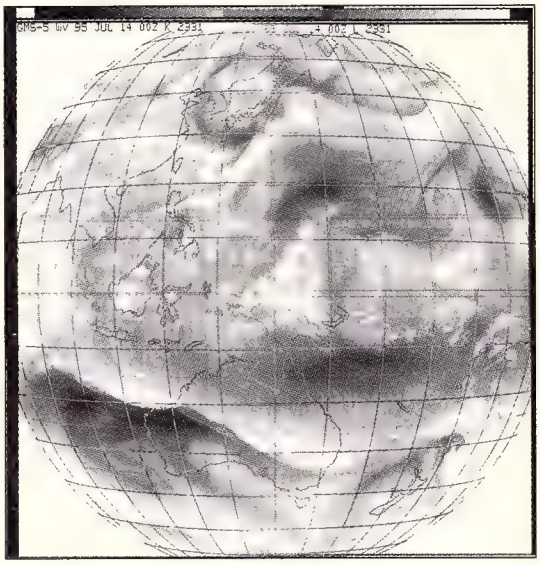
WEFAX SATELLITES

Tuesday, 13 June 1995 proved to be an interesting day. At 0030z, the ageing Japanese geostationary satellite GMS 4 transmitted its last images to earth and was then switched off. Then followed six hours of waiting, until the new GMS 5 was due to transmit its first images. Was it going to work, despite it being the 13th?

GMS 5 was launched from the Tanegashima Space Centre in Japan on March 18 and was placed in a parking orbit at 160° East whilst tests were conducted. On May 26 GMS 5 started to move towards 140°E, presently occupied by GMS 4. On June 9 GMS 4 commenced its move away from 140°E, headed for its standby position at 120°E where it was due to arrive on July 21. GMS 5 was due to start transmission on July 13, two days before it actually arrived at its permanent position of 140°E.

This information was supplied to registered GMS users by Michael Kenny at the Bureau of Meteorology in Victoria.

It is amazing how they can move these satellites around like pieces in some gigantic chess game. However I prefer to think of it as a game of snooker, where GMS 5 was hit by a large cue giving it plenty of backspin whereby it nudged GMS 4 out of the way and popped neatly into the pocket. It's great to have a vivid imagination!



0600z approached, and I was a bit worried that I might have to adjust the dish as the satellite was still slightly off from its parking position. I need not have worried; at 0602z the sync tones were heard followed by the start tone, and GMS 5 was in operation.

As normal, it sent the infrared and visible light images of the Japanese area followed by the four-sector earth disk image which includes Australia. I have shown a composite earth picture made up from these sectors, which were the first to be transmitted by this satellite. The images were slightly different from those received from GMS 4 and remained so until GMS 5 finally reached the position vacated by GMS 4.

The new satellite, besides doing everything its predecessor did, also had a new product to disseminate — a four-sector earth disk image of water vapor channel images, which are transmitted every 12 hours. This had me intrigued and, although the first of these was to be transmitted at 2310 local, I decided to wait till the 1120 local the next day.

The images were interesting, to say the least, showing large bands of water vapor swirling around the face of the planet, as can be seen on the composite image. However, at this stage I have not worked out how to interpret the image.

The Japanese Meteorological Centre did publish a scale to be used with these images, but possibly being a little slow on the uptake, I have not yet worked out how to use it. The scale has 64 levels based on the temperature in degrees K. For example 170.0° K = 63, through to 268.2°K = 0. Now, given that the temperature in degrees K can be obtained from the grey scale above the image, (where each shade of grey represents a temperature range in Kelvin and these ranges can be false colored if needed), it still does not say what the 63 through to 0 actually signify. Do they relate to moisture content, altitude or what? Hopefully I will have the answer by the time of the next issue.

Readers will see that there is a distinct difference between the normal infrared images and those of the water vapor images. Congratulations must go to the Japanese technicians for another successful geostationary weather satellite that services our area.

On the orbiting satellite scene, it appears that NOAA 10 will no longer transmit APT images due to equipment malfunction. I have heard that it is still transmitting HRPT images but I have not been able to confirm this.

At the time of writing NOAA 9 is switched off, whilst NOAA 12 and 14 continue to function normally. The Russian Meteor satellites 2/21 and 3/5 are both switched on at the moment.

I had a query from a reader regarding the operation of the Russian Meteor satellites. He had noticed abrupt loss of signal from 3/5 before it had reached its LOS position. This situation will occur, mainly during our winter months, when the satellite reaches the day/night terminator. Once the visible light illumination falls below a cer-

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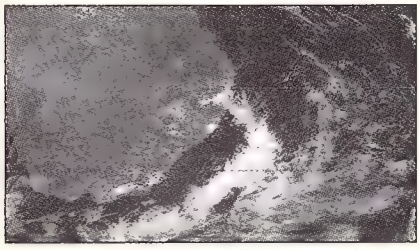

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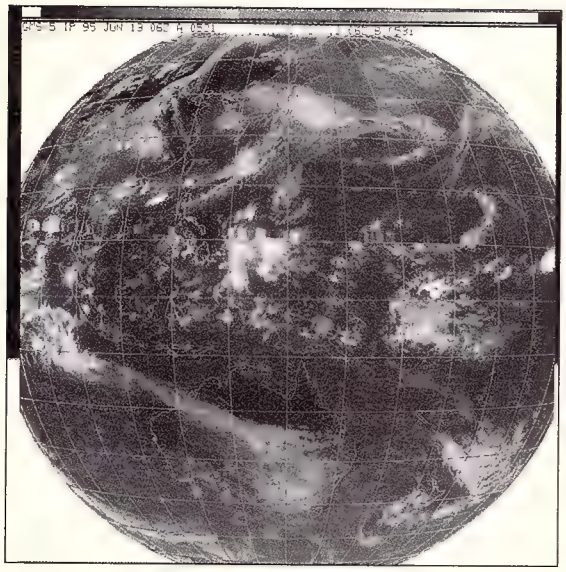

tain level the satellite cuts off its transmission.

Although this satellite is capable of infrared image transmission it does not automatically transfer to this mode as do the NOAA satellites. Ralph, who lives in Quorn, SA, is lucky that he can receive images of the Antarctic coast... unfortunately I am too far north for that.

The Russian Meteor satellites are primarily designed for the observation of ice pack flows as well as cloud formations, hence the difference in contrast between their images and those of the NOAA series. Ralph has received on a couple of occasions infrared transmissions from 3/5 which could be due to the Russian Antarctic station switching it on when it comes into their view. One of the interesting points with the Russian infrared transmissions is that they are reversed to those of the NOAA satellites and show white as being the warmest and black as being the coldest A few years ago Russian infrared transmissions were fairly common, but now are only rarely seen.

I also had an interesting letter from Harry down at Warilla, NSW, who like myself, is interested in building an efficient az-el antenna system for tracking the orbiting weather or Amateur satellites without having to pay big bucks for a ready-made one.

Now, I have no engineering skills whatever (nor plumbing for that matter, as was proven with the Volute antenna), but I am sure that there must be somebody out there who could come up with a design for an az-el rotator made out of old servo or washing machine motors or something.

Our Editor is always looking for interesting do it yourself projects so can someone come up with a design that *works*?

For any teachers who might be reading this article and thinking of using weather satellites in their schools, I would like to remind them that our booklet "Weather Satellites in Education" and a demonstration disk of the Qfax software is available to them on application, free of charge.

I have received correspondence from a couple of schools in the UK which are using weather satellites in their curriculum, and details are available to any teachers who wish to write to them. Talking of booklets, I have shelved the idea of writing a book on weather satellites, due to the hassles and cost of publication so I might give that idea a miss...

Cheers for now and see you next month.

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Benelec 02675 scanning discone

By Len Shaw, VK3ALS and Ken Reynolds, VK3TVS

In last month's R&C we looked at the **Diamond D-130J** discone scanning antenna, and found its performance well above what we'd expected. This month, by way of comparison, we review the Australian-made **Benelec** scanning antenna.

Also a discone design, the Benelec unit (DSE Cat D-4845), has a claimed receive range of 60 to 1000MHz, which is a bit shorter than the Diamond's 25-1300MHz. On the other hand, its recommended retail price is just $99.95 — almost half the cost of the Diamond, which has a rrp of $189.95.

Discones have been widely used throughout the communications industry for many years, however since the popularity of wide-band scanner receivers has blossomed in recent times, the spiny, discone wide-band antenna has experienced a minor boom in the semi-domestic market.

From an assortment of manufacturers and models, the Benelec #02675, stainless steel and chromed brass discone is one that stands out because of its relevance, favorable price, construction and all-Australian manufacture.

Antennas like the Diamond and Icom's very similar AH-7000 are pretty much considered to be the 'benchmark' scanning discones with their 16 elements constructed from stainless steel tubing (hollow for the lower cone assembly) while the chrome-plated apex assemblies are indicative of the overall high-quality construction.

In comparison, the Benelec might be considered as an intermediate design with its six disc radials and set of six skirt spines wrought from 2.5 millimetre-diameter stainless steel rod. All the elements are threaded at one end, and they screw directly into the appropriate hub sections.

The rods forming the disc are 370 mm long and the cone spines 1080 mm in length. Cheaper models we have seen are made from aluminium, employing only three or four elements in each section for disc and cone, while the more expensive stainless steel models (such as the D-130J) generally use pairs of eight elements.

The whole antenna is quite light and weighs only 1.26 kilograms.

The Benelec is supplied as DIY kit and, when assembled, the antenna stands just over one metre tall (1020mm) and is approximately 980 millimetres in diameter. A stainless steel mounting tube measuring 600mm long by 25mm diameter forming a strong, secure mast fits co-axially up inside the cone section where it attaches to the main discone hub by three stainless steel screws.

A relatively small point, but one indicative of the Diamond's overall better quality of construction is the use of two simple 'radiator-type' hose clips by Benelec for attaching the antenna to the mast as against two formed (and far more robust) purpose-built clamps used on the Diamond.

Both arrangements will adequately do the job, and Benelec's approach certainly keeps costs lower — however, in terms of quality, the Diamond is out front.

Unlike the Diamond, the Benelec does not incorporate the loaded top element and so misses out on a little low frequency coverage.

Each of the threaded elements is supplied with a stainless steel lock nut that fixes the radials permanently in place. However, to be on the double safe side, we'd recommend the use of Loctite or a similar compound, as a final security for the screw threads. We recall having an unfortunate experience some years back with a competitor's product (not one of the units mentioned here!) which used tubular stainless steel skirt spines attached by only a single set screw for each skirt spine. Some of the skirt elements appeared to be 'growing' in the front garden from time to time! Strange?

Anyway, let's be honest: an antenna should be a largely maintenance-free assembly!

The Benelec antenna is not pretentious, but its claimed frequency bandwidth of 60MHz to 1000MHz is substantiated by our swept frequency analysis of the product. While it exhibits expected minor discontinuities in feed impedance at a number of spot frequencies, the overall VSWR was largely below 1.8:1 for the whole specified frequency range — an excellent accomplishment.

No attempt has been made to extend the upper or lower operating frequency limits, but then the bulk of listening interest for most operators lies within the offered frequency range, so there is little need for extras.

The antenna is fed with 50 ohm coaxial cable terminated in a PL-259 (UHF) connector which mates with a female UHF-type fitting (SO-239) mounted in the base of the cone's hub which, when fully assembled, is concealed by the mounting mast.

The performance of the #02675 is as expected and no extraordinary features were observed, except that the thin radials tend to whistle a bit in the Melbourne winds. Mind you, this is only a comment and not really a complaint.

As a transmitting antenna, it works quite well on the air band, the two metre and 70cm amateur bands and, with a squeeze, it can be useful a tad higher in frequency too.

We did not have the time to check the omnidirectional integrity of the antenna, but we have no reason to suspect any serious defects in symmetry or smoothing that a couple of extra elements would not correct. The materials used are of excellent quality and production is very good.

Although it must be said that a mass-produced machine-made antenna like the Diamond is arguably of better metal again, the on-air performance of both is virtually identical, and switching from one to the other produced virtually no discernible difference in medium to strong signal levels while barely heard, scratchy signals on the Diamond were as close to identical on the Benelec as doesn't matter.

We'd have to confess that we had expected a marginally lesser performance from the Benelec than from the Diamond given the 12 elements versus 16 situation, however such was not the case in terms of 'listenability'.

Granted that the Benelec coverage range is a tad more narrow than that of the Diamond, and that the construction is maybe not as pretty, for a price difference (saving) of close to $100 we would be choosing the Benelec. And it's Australian... Priced at $99.95, the Benelec #02675 is good value — comparatively speaking — and should produce good wide band results for many maintenance-free years.

We can confidently recommend this antenna to anyone who requires a medium specification, wide-band antenna within the noted operating frequency range.

R&C thanks Dick Smith Electronics for the supply of the review antenna.

***Now go to page 97 and win one for yourself!***

EQUIPMENT BRIEF

RADIO and COMMUNICATIONS - September 1995 — PAGE 21

Emtron DX-2 'Powerhouse' linear amplifier

By Neil Duncan, VK3ND

When the HF bands are crook, there are two ways to both work DX and to warm the shack at the same time. One is to use low power on CW, straining your ears and using all of your skill — and with the electric heater running at your feet. The other is to run some real power, ionising the ether between your massive beam antenna and the poor unsuspecting DX station at the other end.

The **Emtron DX-2** is an all-Australian device which will definitely put you into the latter category. This, to my knowledge, is the singularly most substantial linear amplifier ever designed and built in Australia for the exclusive use of radio amateurs. Actually, it is one of the most substantial *anythings* in Australia at the moment, including the Leopard Tank and the Opera House. Let's see how this delicate powerhouse performs and how well it warms the shack...

The design

Rudi Breznik, **VK2AOT**, owner of Emtronics (you know — antenna tuners, TET-Emtron beams and the like) has spent several years poring over designs and looking for ways to extract the very best from the world's inventory of linear amplifiers parts. I've seen some of his designs. They have included 3-500Z units and physically have ranged from commendably small to very large. Not many have made it to the market place because these guys are perfectionists. The smallest imperfection in a design and he scraps the whole thing and starts again. This one made it...

The bottom line is this: Rudi fell in love with the 4CX-800A tetrode tube, with his particular version emanating from the Svetlana company in St Petersburg, Russia. With it, he has crafted a single-tube amplifier (the **Emtron DX-1**, which is soon to be released) and this whopper, the **Emtron DX-2**, which uses a pair of the tubes.

So why a tetrode? Simple. The performance characteristics of the 4CX800-A allows its use in a high gain, grid-driven amplifier with a passive (resistive) 50 ohm untuned input circuit. In this mode and with a mere 40 to 80 watts of drive, an exceptionally stable and low distortion amplifier not requiring neutralising or complex input switching is possible — consistent with some real grunt arriving for delivery to the antenna.

So I have been allowed to play with one. Let me summarise what I found. With the power setting in the LO position, I was able to run the legal VK power comfortably and with no stress on anything. Let's face it, with 1600 watts of plate dissipation at my disposal, this set-up will last for a very long time in such a mode. With my oil-filled dummy load connected and with the switch on the DX-2 in the HI power position, I ran a continuous 1500 watts of power — but after a few minutes the oil ran too hot. This device will certainly run that sort of power for at least one hour continuously — probably all day if you tried — I didn't. Rudi does, however, claim a continuous duty cycle — and nobody else does that!

Special features of the DX-2 include:

- Operation from 160 to 10 metres.
- SSB, CW, AM, RTTY and SSTV supported.
- Fully-digital display system with separate LED bars for power, reflected power, plate voltage, plate current and screen grid current.
- A massive turbine blower force cools both tubes.
- HV filtering is rated at 58 microfarads at 4000 volts.
- 1500 watt output capability with 1600 watts of plate dissipation. VK power levels set by a switch.

Setting up

The DX-2 really is unbelievably heavy. I swear that lifting it out of the boot resulted in the car's front wheels returning to the ground. As well, there was the personal acceleration towards my used-by date plus the stressed sound from the shack bench as I gently lowered it.

Once you unhook the crane used to install the amp in your shack the action of connecting the various cables you need (AC, antenna, transceiver RF, ALC and relay switching) takes on a new dimension. You can't easily lift the amplifier to see what or where you are plugging in. Oh well, if that's the price of power...

Removing the lid from the case quickly tells you what makes it so hefty. Absolutely everything is massive, bordering on 'over-kill' for strength, power and durability. The laminations on the power transformer total almost 15 cm in thickness, the sub-chassis systems use truck-loads of metal, the blower looks like a medium-sized car alternator with a turbine attachment, and the silver-plated final output stages could easily have been 'borrowed' from Radio Australia.

In fact, the power transformer in the review unit was actually designed for the DX-1 unit, as the far heavier DX-2 tranny was not yet ready for installation when this prototype unit was constructed. (The more affordable DX-1 employs a single 4CX800A rather than the two in this unit.) The C-core transformer to be used in the DX-2, hard to believe, is even larger than this one...

The cooling blower is somewhat unique in the amplifier world. Its rated 75 cfm (cubic feet per minute) is a third more than any other mainstream amplifier we've heard of, and is almost a case of overkill. But where cooling was concerned, we found the whole thing stayed as cool as the proverbial cucumber *all* the time, even if that huge fan was trying its utmost to blow the finals right out of their sockets.

And finally, there, to the right and near the rear of the case, are the recipients of all of this attention: the pair of sleek-looking output tubes themselves, all rugged up in their ceramic chimneys.

Nothing is left to chance. Looking around inside the case reveals an interlock microswitch, as well as temperature sensors, fuses and boards and sub-boards and protection schemes everywhere.

Anyway, I took me no more than a few minutes to connect it all up. (I reached in from outside through the shack window!) I used the ordinary 240 V wall outlet for my VK power level (on air) testing, but later, for the high power dummy load tests, I ran a heavy cable to the external 15 amp wall outlet, the one I use for the welder and so on. Finally, I read the manual, taking in the sections about the tuning up procedure and about how to take care of the screen grid.

On the air...

Your transceiver really needs to have a control for adjusting its output power level. 100 watts, for example, will grossly overdrive the DX-2. Anyway, when the moment arrived, I switched the DX-2 on (watch those house lights dim for a moment!), cranked the transceiver power down to about 40 watts and pressed the PTT key. Hmmm, nothing. Ahh, the DX-2 insists on a two-minute warm up period and, believe me, the internal timer circuit makes sure you don't forget by making it inoperative for that period of time.

So now, with the band switch set to 20 metres, the unit in low power mode and with the correct antenna, let's try again. Select a carrier mode (I used the RTTY setting on the transceiver), press PTT and clunk, the DX-2 relay switches over. The Christmas tree effect of the LED panel is quite dazzling. The voltage is up around 2400V and I am running some power into the antenna, the panel assures me. Dip the final (this takes on a new dimension when you are using LED bars!) and adjust the load control for maximum output. Repeat the process and there, in seconds, we are tuned up.

Back to SSB and a quick whistle... and I am running some real power at last! But wait, that screen grid current LED bar, the one you quickly learn to watch most of the time, is dancing a little into the red. If you really push it, the last red LED in the line will start to flash continuously, warning you to monitor your drive level carefully. A slight increase on the LOAD control and a quick re-peak of the tune control fixes that. There, we are on air at last.

Regular amplifier users will be interested to learn that there is absolutely *no* indicated SWR on the input on *any* band, at *any* frequency. That's a very rare and very pleasing accomplishment indeed.

Initially, I had a little trouble with RF feedback despite having a well-earthed antenna system (there's a large wing nut earth connector on the back of the DX-2). Using the rig's supplied microphone (rather than my cobbled-up one) fixed that. It seems that linear amplifiers assume that proper earthing and proper shielding is used throughout your entire shack. Well, at least I learnt *that* lesson quickly enough.

My early on-air tests revealed a few things. The signal I was putting out consistently went up two to three S-points on a DX path, although on a mere local QSO, only the theoretical number of dB of gain was ever seen. More importantly though, all of a sudden I had DX stations calling and even queuing up to work me; this thing works — and remember, all of my tests were conducted in LOW power mode, meaning the whole thing was completely understressed... just the ticket to make it last a long time!

After a couple of hours of use, I switched off, removed all the cables, removed the covers, waited a few minutes for the HT to dissipate then double-checked that no HV was present anywhere, then 'hand-tested' the temperature of as many components as I could access. Near enough to cool as a cucumber.

Quality, quality

Where do I start with a discussion of the quality of the DX-2? First and foremost, the transmitted signal is absolutely as clean as a whistle. The Emtronics claim is that the distortion products are 50 dB below the transmitted output. I suspect that this is truly the case. In all the tests I did, no-one found any splatter outside my normal bandwidth, even when I was very strong indeed at their station.

The extremely close input matches (to your rig) the optimised output tank circuit and, of course, the output tetrode characteristics put together by our UA-land friends all really add up. Those harmonics and third-order intermodulation products are better than 50dB and 35dB below rated output respectively.

Then there is the design and construction quality of the unit. With only three large controls and three small switches, the DX-2 sports a sparse, uncluttered front panel. On the other hand, when you switch on, no fewer than *five* monitoring LED bars simultaneously appear. Imagine what five separate meters would look like, or perhaps how complex conventional meter switching would need to be to monitor everything at once. The front panel is beautifully silk-screened and the case is covered in a durable baked enamel.

Peeking inside the DX-2 provides a wondrous sight. Things are uncluttered and everything seems to be in a logical place. The huge capacitor bank is safely tucked away inside a sub-panel arrangement and the input circuitry is all neatly packed inside a special RF-tight box under the tubes.

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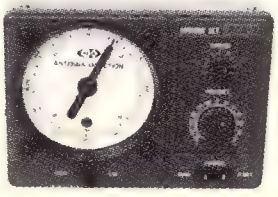

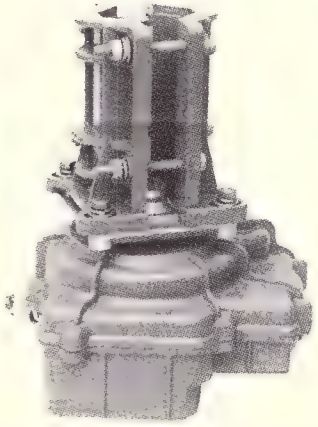

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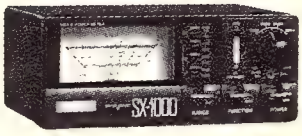

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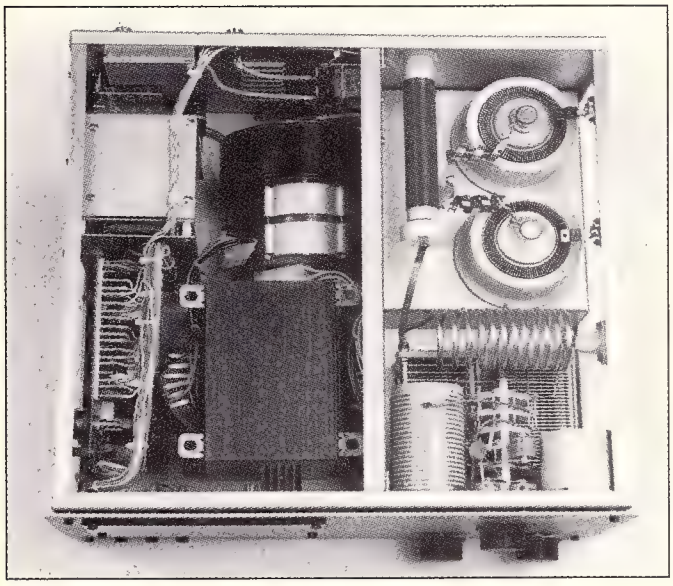
Any negatives?

Well, yes to be honest, but only a couple. First, the antenna changeover relay, being as large and as solid as it is (like everything else in the DX-2), hardly operates at a suitable speed for Packet, PacTOR, AMTOR or QSK CW operation. Rudi tells me that there is a pin diode QSK switching system on the drawing board.

The second negative, for me, was that the huge blower really made its presence felt in my quiet shack. Do you use a speech compressor? If so, those DX stations out there are bound to be impressed, because they're sure to hear the amp puffing away.

Thirdly, there is the matter of what you see when you lift the lid off. Now, while the 240 volt line to the amplifier is disconnected by a microswitch when the cover is lifted off, and while the power supply has a set of bleeder resistors to run the HV down to zero when the power is removed by whatever means, some 'hot' connectors seem a little too accessible to bare hands. Some opposition amplifiers cover things up with mesh-metal and protect you with a crow-bar shorting arrangement should you lift that mesh up.

We've discussed this point with Rudi, who seriously considered it. The bottom line, he says, is that most contemporary amps no longer have everything covered up. The ones which do were designed many years ago, and use a steel cabinet. Try finding slotted mesh aluminium and you'll see the problem. And, as Rudi says, if you have your car's bonnet up, will *you* put your hand into the radiator fan to see what happens? I guess more than a little bit of common sense of called for when you have an amp as large as this one. You simply don't muck around inside it...



Positives

Let's put all of this into perspective. This a truly magnificent amplifier. It's very, very hard to find fault with the concept, design, or execution. It is heavy duty in a manner very rarely seen in these days of cheap mass-production.

With care, it will last a lifetime and, in my opinion, will provide you with a means of transmitting the loudest (as permitted in Australia) and cleanest signal you could possibly imagine.

Tuning up the DX-2 is a snap and is quite broad. There are simply no fiddly extras or things to do along the way. Keep an eye on that screen current and all will be well. Remember, this is a *continuous duty* amplifier, so it really will idle along in application you and I are ever likely to put it to.

The sheer quality of the DX-2 is breathtaking. I would almost suggest that a clear plastic cover be used instead of the RF-shielding metal that the DX-2 has in place as a roof for the system. The components inside deserve a good looking at!

Summary

Given the huge investment Emtronics has made in developing this magnificent new amplifier, it's clear that the company had far more than just the local market in mind for it. Rudi tells us he planned from the outset for this amplifier to be an export success as well as being available to the Australian radio amateur. He has already taken a long list of orders from Europe and has received rave reviews in Japan. Yes, Japan, the home of the Big Three.

The problem is that people in those countries may well then turn around and expect *all* Australian exports to have such a stamp of quality. Of course, many of our exports do have such standards, but this one is really an exception.

If you are in the market for a complete, 'no extras' linear amplifier with the grunt and reserve you deserve, have a close look at the DX-2. The simplicity of operation, virtually continuous duty and intelligent protection schemes, are outstanding.

The retail price is set at $3950, and you certainly get what you've paid for! Want something a little smaller? Wait a while, the DX-1 is just around the corner!

RADIO and COMMUNICATIONS thanks **Emtronics** for the loan of the review amplifier.

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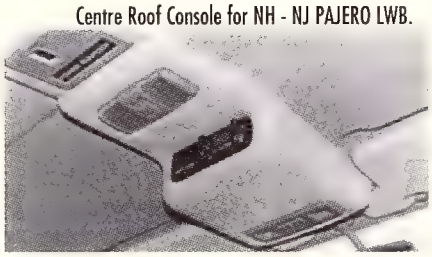

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Sangean ATS 818cs

By Craig Seager

It's a world band receiver, it's an alarm clock, it's a cassette recorder! We asked our regular Shortwave columnist to put Sangean's flagship ATS 818cs through its paces to discover whether it will also cook the dinner. The short answer is 'no', but this useful portable boasts plenty of other features to compensate...

Let's face it, buying a communications receiver can seem a daunting task, whether one is looking for a semi-professional desktop model or something a little more modest in the portable range. The astute buyer will be busily weighing up the importance of 'nice to have' features against fundamental issues such as performance and price...

Are scanning abilities just as important as a good selectivity curve? Do I take the set with superior dynamic range or the triple-speed tuning? How many memory positions are enough? Am I going to be able to hear the news from Iceland? Such are the questions that will determine which model will eventually be carried home under your arm.

Happily, after a good many years getting it *almost* right, receiver manufacturers are for the most part now managing to combine numerous useful features with half-decent performance. In all but the very low end of the market, old bugbears such as frequency drift, excessive birdies and serious overloading are becoming things of the past.

Considerably less than a week's salary will now buy a receiver that will do a lot more than many of the 'boat anchors' of yesteryear, and quality standards are continuing to improve. For some years now Taiwan's **Sangean** company has been at the forefront of this 'affordable' receiver market, and distribution of its analogue and digital portable sets is now worldwide, though occasionally under other brand names such as **Siemens**, **Radio Shack** or **Realistic**.

I should point out from the outset that the Sangean ATS 818cs is not a new model, but has been a solid enough performer over the two or three years of its availability that a replacement has not yet been mooted. Much of the mail that crosses my desk involves requests for information on various receivers, hence this opportunity to provide a brief outline of one of the market leaders is welcomed.

The PLL (phase-locked loop) synthesised ATS 818cs offers continuous coverage with dual conversion from 150-29,999 kHz, plus the standard FM band (in stereo through headphones). Tuning of those frequency ranges can be achieved in four ways, the preferred method being entry via a built-in direct access keypad; you can also switch to a specific metre band with a couple of keystrokes.

A rotary dial is positioned at the side of the radio, and changes the frequency in 5 kHz increments as the default. Fine tuning — in 1 kHz steps — is available at the flick of a switch. It is also possible to store up to 18 different shortwave frequencies in memory, and up to nine channels for each of the other bands (medium wave, longwave and FM). Operation of this facility is very simple indeed. For those who prefer, there are also the now customary up/down buttons, though for many these would be superfluous, except for the fact that they enable a scanning function when depressed for more than half a second.

Frequency display is a large LCD affair, which can be momentarily backlit using an easily accessible push-button switch. The time (in 24-hour format) is also displayed simultaneously, and there is provision for programming a second time zone, such as UTC or 'z'. The signal strength meter also makes use of LCD technology and is represented by an ever-

moving horizontal bar at the bottom of the viewing window. Although basically crisp, the display itself can be a little difficult to see if not viewed from the correct angle.

What separates the ATS 818cs from the rest of the communications receiver market is the thoughtful provision of an in-built cassette recorder/player, which can be used to play standard audio tapes as well as recordings made from the receiver itself. This is a very handy facility, and all standard cassette deck controls are present, including a selector switch for the higher quality chromium dioxide tapes, a small condenser microphone and a 'beat cut' option to reduce noise (there is no Dolby noise reduction available).

The cassette recorder section can be activated by a standby/timer control, allowing the user to record programs whilst not at home or off in the land of nod. There is no 'off time' setting, and cessation of the automated recording session relies on the auto-stop function of the cassette recorder disengaging the tape when the end of the side is reached.

The timer also allows the set to be used as a normal clock radio. Imagine waking up to informative news from the BBC for a change, rather than the usual rap screechers and DJ banter featured on most of our local stations! Ah yes, and you can also use the ATS 818cs as a soporific, as the radio will switch itself off after a specified interval; when this facility is activated a quaint icon showing a person in bed appears on the LCD screen!

Resolution of single sideband and CW signals is via a manually-tuned BFO (beat frequency oscillator), though the skill of a surgeon is required to get the control dead center. Once this is achieved, however, the audio is quite good, though I'd much prefer selectable USB/LSB by a switch arrangement. Other front panel controls include a variable RF gain, tone and AM narrow/wide bandwidth settings. The latter switch also doubles as an FM mono/stereo selector.

An external antenna may be connected via a 3.5mm phone jack on the side of the set (an adaptor plug is provided); the one metre telescopic whip is quite okay for stronger signals.

The Sangean is powered by four 'D' cell batteries, but I wouldn't expect these to last for any more than a few hours of continuous use. It would be much better to use a 6V DC adaptor (not supplied) for connection to the mains supply. Three 'AA' penlite cells maintain clock and memory presets when the power is disconnected. The set ships with a brief but well-written operator's manual and a basic guide to shortwave radio, including some frequency information which should not really be taken as 100 per cent gospel.

So much for all that, but how does it *perform*? Pretty well, I'd have to say. The two AM bandwidths provided are a little broad for making useful signals out of vague heterodynes, but are certainly more than adequate for some intensive program listening.

Sensitivity appears quite good — I'm listening to the 10 kW Ecuadorian Radio Quito on 4920 kHz at armchair level as I write this (a couple of much more expensive desktop receivers nearby aren't doing any better with the same signal by any means). FM band sensitivity could be a little better, but then most people are really only interested in local reception on this band.

Dynamic range is generally a problem with all but the most pricey receivers on the market today, and some overloading on medium wave was present from 2BS (1503 kHz), the local AM station in these parts. The Radio Australia 49 metre band outlets also presented a bit of a problem early evenings, but these are really massive signals and I've seen better credentialled sets fail to cope with these as well. Backing off on the RF gain a bit generally helps in these situations.

All in all, then, the Sangean ATS 818cs could be described as a user-friendly portable with plenty of useful attributes. Provision of the cassette recorder option gives the set even broader appeal, as does the price — listed at $369.00 (or $40 less without the cassette option), an ideal figure for anyone looking for something that's significantly better than an entry-level receiver.

Radio and Communications thanks **Dick Smith Electronics** for the loan of the review receiver.

Okay, so why are we talking about a radio which came out a couple of years ago? Simple. We want you to...

WIN A SANGEAN ATS 818cs

Yep. Yet another crazy **RADIO and COMMUNICATIONS** reader competition. We're so generous we must need our heads examined. You could win one of these surprising receivers valued at $369, thanks to **Dick Smith Electronics** and **R&C**, simply by sending your name and address on the back of a standard-sized envelope (no cheating, please!) to

RADIO AND COMMUNICATIONS
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CONGRATULATIONS!

Well, we've drawn our first competition winners. The equipment shown on this page will soon be winging its way to the lucky winners, who are named below.

If you didn't win, never mind — there are four more prizes for you to catch this month!

Okay, we won't keep you waiting any longer...

It's congratulations to Niall Thoresen of Morayfield, Queensland, who's the lucky winner of our fabulous Uniden UBC9000XLT scanning communications receiver, courtesy of RADIO and COMMUNICATIONS magazine. Hope you enjoy using the 9000 as much as we enjoyed reviewing it for you, Niall. (And no, you don't get the review one with the screwdriver gouges. We bought a brand spanker for you, so enjoy...)

The landmark Icom IC-Z1 dual-band two metre/70cm remote-control HT goes to the very fortunate Geoff Wood, VK6AT, of Mandurah, Western Australia. This surprising HT sets a new standard in an affordable package — and that remote-control cable is chucked in as a part of the package.

RADIO and COMMUNCATIONS thanks Icom Australia for its support — it supplied this prize for you, Geoff.

Now... four *more* prizes this month! Will it never end? Better head off to page 97 for one of three antennas, or get in quick for the Sangean ATS 818cs right opposite. Good luck!

Snippets

Melbourne 23cm amateur users are in for a treat, with the second 23cm repeater installed and operational.

The newcomer, VK3RDA, has been supplied by eastern suburbs dealer Strictly Ham, and is now operational on 1273.4 MHz, with an input 20 MHz higher. Location is The Basin, although it's shortly to move to the summit of Mount Dandenong.

VK3RDA joins VK3REO in the west, on 1273.15 MHz.

These will soon be joined by a third unit, to be installed in the city center.

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***Note that this board obtains its 256k cache memory from the dynamic memory not from the cache onboard (This is not real cache but only* empty chips).**

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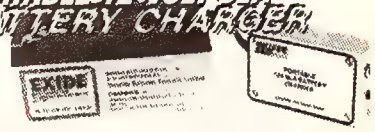

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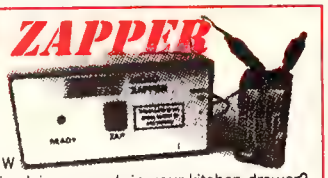

Do you have a few suspect Nicad batteries lying around in your kitchen drawer? Why not try bringing them back to life with this Nicad Zapper? It zaps the cell with a high-voltage, high-current burst to blast away any internal shorts caused by dendrites. **SC August '94**

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Modifications

Disclaimer: *be aware that you may void your warranty by performing any of these modifications. R&C has not tested them and makes no warranty as to their serviceability.*

Kenwood TS-120S hints and fixes

There are many of these popular units still circulating around the place. As they age, a number of common problems start to surface. Here are a few, and their cures...

Owners may notice intermittent oscillation on one or more bands, generally the higher frequencies. The symptoms of the problem will include no control of the carrier level, full current or ALC in either CW or SSB modes after the initial keying up, or modulation of the transmission or, finally, 'full output on both forward or reflected' as observed on the radio's metering. The cause of this oscillation may be either external or internal.

Externally-induced oscillation is that which only occurs when you are operating on an antenna system, or suspect RF feedback coupled through the mic key or other connected wiring.

There are a number of suggestions to fix this. Add a 0.01 mF bypass capacitor across pins 1 and 4 of the microphone connector. If there is not one there already, solder a 0.01 mF capacitor across pins 3 and 4 of the mic connector as well. Finally, add a ferrite bead at the base of the mic preamp, Q18, or at R42.

For internal oscillation, make certain the antenna plug on the rear panel is tight. Check and make sure that there are no loose screws securing the Relay Unit X41-1250-00, located over the RF unit X44-1260-01. Use star washers on any loose-fitting screws if necessary.

Check the DRV (drive output) coax on the RF Unit for a snug, secure fitting at both the center and ground conductors. Continue on this coax up to the Final Unit X53-1250-00 and ensure all connections are secure. Finally, check diodes D2, D3 and D8 on the RF Unit for high reverse leakage. You can do this by desoldering one end of each diode and check with a multimeter. If there is any doubt, replace the diode.

More Kenwood TS-120 fixes

Here is a list of the more common faults encountered with aging TS-120 transceivers (and, let's face it, we *all* age) and the general fix for it.

- No CW and no audio from the radio: Check the Sidetone oscillator Q25 on the AF GEN unit. The component is a 2SC1815.
- Receiver sensitivity noticeably down: component T1, L34-696-35 on the RF unit may be a short circuit.
- Loss of digital display: check P5/J5 on the Carrier Unit.
- Received audio bad on SSB mode: check for IF shift control turned fully clockwise. (Don't laugh... it happens more often than you might think!)
- Meter indicates maximum on receive with little signal present: check that the RF gain control is *not* turned fully counterclockwise.
- VFO drifts noticeably: replace the temperature compensator capacitor C17.
- Transmitted audio is not great: check the Carrier Point adjust and ensure that the final bias is set to 150mA.
- High input current in receive only: check the final transistors.
- Radio only selects 15 metre band: the BCD rotary band switch may have a broken wafer.
- Radio only receives and transmits on 10 metres: the BCD divider Q16, a 74LS163 chip on the PLL unit, is defective. Check the BCD inputs against the pin 2 frequency.
- CW filter does not function: check for solder shorts across pins 1-2 of J29 on IF unit.
- No receive after installation of CW filter: most commonly caused if the pins of the CW filter were not clipped close to the board, thus shorting the signal to ground.
- Analog dial differs to digital readout: carry out VFO tracking adjustment at 50 and 450kHz steps.
- No 15 metre operation: core in the VCO transformer for 15m broken.
- Low RF output on all bands: component Q12 SN16913 on the AF Gen unit is faulty. Component is a 2SK19GR.
- No transmit on all bands: inductor L25 on the RF unit is open circuit. L25 is a small green inductor.
- No transmit: possibly loss of AVB voltage at RF unit. Check Q9 2SA473 on the filter unit, also check 6 volt zener diode.
- No digital readout and no transmit: commonly the Q12 mixer on the PLL unit board is faulty.
- No receive and nil digital readout: problem generally is the Q26 mixer on the PLL board.
- Intermittent audio in SSB mode: check pin 5 of connector J5 on the AF GEN unit for loose connection.
- No key down transmit: check D26 and Q24 2SA562 on AF Gen unit.
- No CW transmit: resistor R8, 220 ohm, at key jack open circuit. Ensure that you use a shielded line on the CW key.

Yaesu FL-2100B mod for 12M

There is not much activity on 12 metres at this end of the sunspot cycle, so a bit of a helping hand in the power department would definitely assist to get the most out of this quiet band.

If you are fortunate enough to possess a FL-2100B linear, then it is not a difficult thing to modify it to tune up on 12 metres. The 10 metre power output will suffer, however there is a way to rectify that somewhat.

Place the unit on its side with the LOADING control nearest the surface that the amp is sitting on. Ensure that the amplifier has been disconnected from power (most important!), and that the plate voltage has dissipated before you start delving into the innards. Remove the screws that hold the bottom cover on and remove the bottom cover completely.

Now, set the BANDSWITCH to 10, set the PLATE CONTROL to 9, and set the LOADING CONTROL to *fully* counterclockwise.

Disconnect the 850 volt red wire which leads from the transformer to the diode board. The diode board is located right behind the TRANS-OPERATE switch.

Install an SWR bridge between your transmitter and the FL-2100B. Tune the transmitter to 24.950 MHz. Turn the FL-2100B on and place the amp in the OPERATE mode.

Inject an AM signal into the FL-2100B, enough so that you can calibrate or set your SWR meter.

Place your SWR meter in the REV position and read the SWR. While in the TX mode, tune L206 until you achieve your lowest SWR reading. L206 is located near the grounding wingnut just inside the amplifier chassis.

Right, you have just completed the retuning procedure of the 10 metre antenna input coil.

If you still desire to operate on 10 as well as 12 metres, just retune L206 on a frequency between your operating frequencies on both bands. Now, resolder the 850 volt red wire (again, with the unit off and unplugged).

Reassemble the amplifier and make the most of the increased power output on 12 metres.

SCANNER MODS

Maintain PR0-2026 memories

Older PRO-2026s had a slight problem with storing frequencies in memory. Easy enough to program them in, even easier to remove them! Just remove the power — completely — and all the memories are gone. These units had a third power lead that is meant to go directly to the car battery if you installed the radio in the car, and provides a power source to maintain

the memories when you turn off the ignition.

Since most people unplug their scanners and move them at least occasionally, with the older units you would lose all programmed memory frequencies if you were not quick enough to plug in the radio at the next power source. Therefore this mod is for owners of the older radio, whether or not it is installed in a vehicle or if it's used at home.

The aim of the mod is to provide a constant source of power to maintain the contents of the memories whilst the scanner is disconnected from power. You will need a 9 volt battery-type clip and holder.

Mount the holder on the back panel of the radio and run the leads from the battery clip inside.

Tie the negative lead to ground on the pc board — **not** to the case, as it is not at DC ground.

Connect the positive lead from the battery clip to the place where the third wire originates. That will supply power to the same low current 5 volt regulator used for battery back-up in the 200x series of scanners.

Use a 9 volt alkaline battery and your scanner will retain frequencies in memory for months with DC power hooked up.

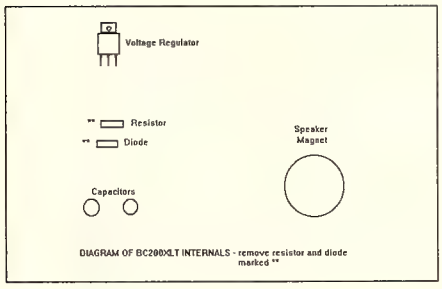


DIAGRAM OF BC200XLT INTERNALS - remove resistor and diode marked **

BC-200XLT battery life extension

There are a number of ways of overcoming the problem of short battery life between charges in a BC-200XLT scanner. The inconvenience stems from a low voltage detector circuit in the radio which shuts the radio down when the batteries fall to a pre-determined voltage. Unfortunately, this level is not adjustable and tends to be well above the useable working voltage for the batteries and the radio. The end result in many cases is only around two to three hours between charges, which is clearly not acceptable. Here is a way to disable the low battery cutoff circuit and allow up to eight hours of operation from a single charge. Interested?? Read on.

You will need a Philips screwdriver, a fine tip soldering iron and a decent desoldering tool. Also, you should be reasonably competent working with fine components. This mod is pretty difficult to do with shaky hands...

Away we go:

Remove the battery pack and the two screws from the bottom spring clip.

Detach the rear cover from the radio, beginning from the bottom first. Take out the two small screws at the base of the circuit board and pull away the front panel from the main assembly of the unit, again from the bottom first.

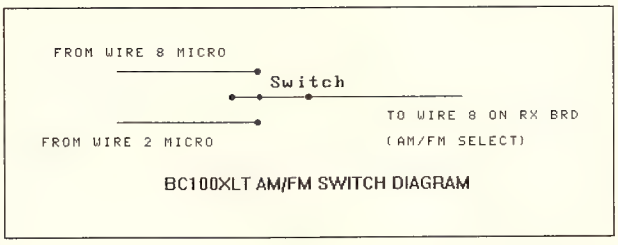
At the bottom of the remaining board are two blue electrolytic capacitors. These are located to the left of the speaker magnet. Above these are two striped components, one resistor and a diode. Refer to the diagram for their location.

The resistor and the diode are the components to remove. Take care to effect the removal without damaging the pc board.

That's all to the mod. Reassemble the radio.

As you insert the front panel into the slot at the base of the volume/squelch panel, take care to ensure that the screw holes are aligned properly. The two rows of fine pin contacts must slot into the socket on the board. If not done correctly — and it is not the easiest thing — then the scanner display will be blank. No damage will be done, but you'll just have to try it again and get it right.

Give the batteries a decent charge and put your scanner through its paces. You will find a great improvement in battery life from pre-mod conditions.



BC100XLT AM/FM SWITCH DIAGRAM

Selectable AM/FM for BC-100XL

Like most scanners that have been around for awhile, the BC-100XL will allow reception in both AM and FM modes. Also like many, however, you don't get any choice of where it will receive those modes. Generally it is AM on the airband of 118 to 136 MHz and FM everywhere else. Mostly this is all you will need, however at some time the need may arise where you want to be able to select AM away from the airband. It can be done, and fairly simply.

This mod will allow you to select AM or FM independently of the frequency using a three-position switch. The switchable options are AM, FM or AUTO (standard operation). You will need a single-pole three position switch with center 'off'. This is the way to do it:

Remove the battery cover.

Unplug the ribbon cable at the bottom end of the radio.

Remove the microprocessor board, which is also the front panel.

Label the 12 wires of the ribbon cable 1 to 12, starting from the left, with the component side of the micro board toward you. Wire 2 is Vcc (around 7 volts), wire 12 is ground, and wire 8 is the signal which goes from the microprocessor to the receiver board to select AM or FM operation. It is 0 volts (open circuit) for FM and Vcc for AM.

Unsolder wire 8 from the board. Connect the switch to wires 2 and 8 as per the diagram. Use heat-shrink sleeving or insulation tape to ensure the connections are well insulated. Mount the switch where you desire.

If you can find a small enough switch, then the ideal location is on the top panel, near the lock switch. Have fun.

Bearcat BC-760XLT squelch fix

Some Bearcat BC-760XLT scanners develop problems with squelch function after some years of operations. The fix is to adjust the component VR1, a 22k ohm trimmer potentiometer sited on the main board. Aging apparently affects the alignment of this component and squelch operation fairly dramatically.

The squelch circuit in the BC-760 has a bit of slop in its operation in standard condition, a problem as a result of hysteresis. The action of the squelch can be improved fairly easily though, by replacing a single resistor, R35.

Resistor R35 can be found by locating the FM IF detector IC, NJM3359D-A (MC3359) on the main board, and turning the board over. Resistor R35 is a surface-mount type component and is located immediately adjacent to pins 12 and 13 of the detector IC.

This 330k ohm resistor should be replaced by a 1M or greater value. A standard 1/4 or 1/8 watt resistor can be used as replacement, by slight modification of the resistor leads. R35 actually connects pins 12 and 13 together.

Reassemble the radio and enjoy a much smoother squelch action.

More tips next time.

Online 1995

G'day, radio people, and welcome to another look into the ever-burgeoning world of radio-related computer software and computer bulletin board systems! This here's the spot in **R&C** mag where I try to show you new ways that your trusty computer can assist in all the various facets of our absorbing radio hobby.

A review of WXFAX3_Ø.ZIP

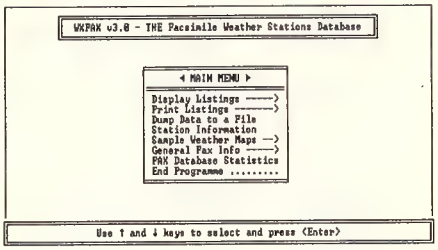
This month I want to kick off by reviewing the latest version of WXFAX, created by well-known Dutch software author and radio utility buff Jan Nieuwenhuis, also a regular participant on the Internet's rec.radio.shortwave USENET newsgroup. Jan's a specialist in receiving weather facsimiles from the planet's airwaves.

Naturally wanting loads of frequency and other weather fax information easily at hand, Jan began writing the Weather Facsimile Database in September 1993, and has been steadily improving his product ever since. This past couple of months saw his release of snappy version 3, and unregistered shareware copies are now available on computer bulletin boards worldwide, and of course on the Internet, under the name of WXFAX3_Ø.ZIP (or other compression extensions, such as LZH or ARJ).

WXFAX has already been well-reviewed by the weather fax specialists in Europe and the United States, which is why the new version immediately caught my attention when it arrived down under a few weeks ago.

"Very useful and well worth the investment," wrote Mike Richards in the British *Shortwave Magazine*. "A program of professional quality," opined Denis Bonomo in the French *MegaHertz Magazine*. And finally, Richard Baker called it "...an impressive little program with a lot of options..." in a US *SPEEDX* publication.

So what does WXFAX actually do? Well, this nifty little database's *registered* version (and more about this aspect later) contains frequency and other information about all the weather facsimile stations around the world which are operational on either longwave and shortwave.


WXFAX v3.0 - THE Facsimile Weather Stations Database
MAIN MENU
Display Listings ----->
Print Listings ----->
Dump Data to a File
Station Information
Sample Weather Maps -->
General Fax Info ----->
FAX Database Statistics
End Programme .....
Use ↑ and ↓ keys to select and press <Enter>

You can instantly call up complete sorted listings in frequency (QRG), station, callsign (QRA) and country (QTH) order. Furthermore, it's also possible to make an ITU country/station list, a station address list, as well as display transmission info, general fax info, sample weather maps, a weather map identification list, and more.

The author says the professional touch in the software came from Jim Nelson, the Port Meteorological Officer of the US National Oceanic and Atmospheric Administration (NOAA), who helped with his input of worldwide marine radiofacsimile broadcast schedules.

Operating WXFAX requires an IBM-compatible computer — a 286, 386, 486 or a Pentium. Nope, it won't run on an old XT, and won't like that ancient EGA or CBA display either. WXFAX needs at least VGA (640 X 480) video capability and 640k of RAM. It's *not* a WINDOWS program and will run on any MS-DOS version after 3.3.

Installation of WXFAX couldn't be easier. Simply decompress the compressed packet, copy all the files to a subdirectory on your hard disk, type WXFAX, hit the old ENTER key and Robert is Mum's brother! You can even run the program direct from a floppy disk. There aren't many modern programs which allow this! If any problems arise, then print the enclosed MENU.HLP file on a printer capable of printing ASCII (graphic) characters, or just use the MS-DOS 'EDIT' program or 'TYPE' to look into the file on screen.

Now, read the next bit carefully! WXFAX is what is known as 'crippleware'. This means that the free unregistered shareware program you can easily pick up from your local BBS or on the Internet (such as at ftp.funet.fi) doesn't have all the features of the registered version. This latter costs the equivalent of A$23 and must be purchased directly from the author in Holland.

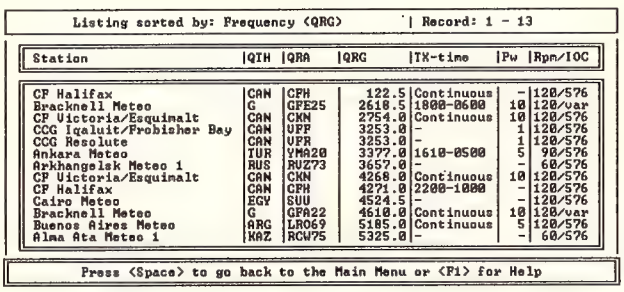
The registered program contains listings of *all* the weather facsimile stations worldwide, and allows you regular updates of both the program itself and the data contained in it. The unregistered shareware version include only a limited number of sample (but accurate) frequencies.

Unfortunately, it is also not possible to change any of the data in either the registered or the unregistered version of WXFAX. Nor can you enter new frequencies or other data. In this respect, it varies greatly from such classic radio software products as Tom Sundstrom's TRS Consultants English language shortwave frequency database. However, payment to the author will promptly get you the latest available fax-database-file (which can be updated continuously throughout the year).

Is WXFAX worth the A$23 registration fee? Well, that depends. If you're a casual weather fax collector, I'd say not. The database won't allow you to enter any frequencies of other services; it's definitely a single purpose program. However, if weather fax is your thing, WXFAX is the Rolls Royce of fax databases and A$23 is chicken feed.

Want more detailed information? You can reach author Jan Nieuwenhuis in a variety of ways:

SNAILMAIL: Jan Nieuwenhuis, Vloedlyn 12, NL-1791 HH, Den Burg (Texel), The Netherlands
E-MAIL: nieuw@nioz.nl
FIDONET: 2:500/202

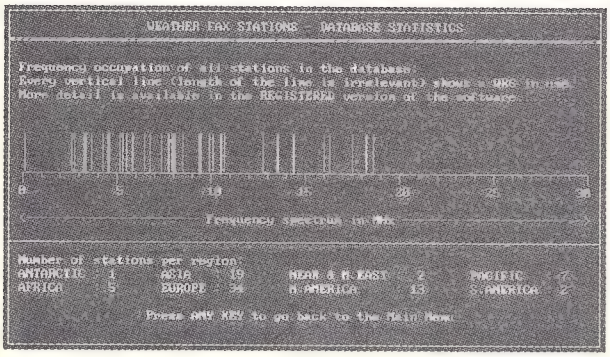

Listing sorted by: Frequency (QRG) | Record: 1 - 13

Station	QTH	QRA	QRG	TX-time	Pw	Rpm/IOC
CP Halifax	CAN	CPH	122.5	Continuous	-	120/576
Bracknell Meteo	G	GFE25	2618.5	1800-0600	10	120/var
CP Victoria/Esquimalt	CAN	CKN	2754.0	Continuous	10	120/576
CCG Iqaluit/Frobisher Bay	CAN	VFF	3253.0	-	1	120/576
CCG Resolute	CAN	VFR	3253.0	-	1	120/576
Ankara Meteo	TUR	YMA20	3377.0	1610-0500	5	90/576
Arkhangelsk Meteo 1	RUS	RUZ73	3657.0	-	-	60/576
CP Victoria/Esquimalt	CAN	CKN	4268.0	Continuous	10	120/576
CP Halifax	CAN	CPH	4271.0	2200-1000	-	120/576
Cairo Meteo	EGY	SUU	4524.5	-	-	120/576
Bracknell Meteo	G	GFA22	4610.0	Continuous	10	120/var
Buenos Aires Meteo	ARG	LRO69	5185.0	Continuous	5	120/576
Alma Ata Meteo 1	KAZ	RCW75	5325.0	-	-	60/576

Press <Space> to go back to the Main Menu or <F1> for Help

A look at SATCOM BBS

In past ONLINE columns we've been looking behind the scenes at various radio-related BBSs to see what's going on and to investigate the human dimension. This month we turn



our gaze towards Paul Britton of Sydney's SATCOM BBS, described quite justifiably as 'Australia's premier source of space and satellite information'.

Some years ago Paul, a long-time space and satellite communications buff, despaired of finding a bulletin board system anywhere in Australia that carried the specialised radio information he required. So he took the plunge and started his own system devoted to the subject. SATCOM has since developed into one of the best-looking and most professional BBSs in Australia, now running the excellent Remote Access v2.2 10-user professional software via two 28,800 bps modems, with two gigs of hard disk space, plus five CDs online. Yep, this is indeed a big, fast BBS!

SATCOM is linked to FIDONET as 3:714/905 and also receives Internet USENET feeds of radio, space and satellite-related newsgroups. It also offers more aviation, missile and space .GIF picture files than you've ever seen in your whole life!

Paul works hard at keeping totally up-to-date with all the latest satellite communication information, offering his users a complete collection of NASA press releases, including the latest information on Space Shuttle Missions, and all the latest 2-line element files required for satellite tracking software, such as STS Orbit Plus, previously reviewed in these pages. The satellite info comes online weekly, as soon as they're issued in the US. Naturally, SATCOM also provides all the latest radio comms shareware software as well.

A special feature is SATCOM's complete collection of issues of AMSAT Space News, European Space Agency releases, 'Skunk Works Digests', ARRL bulletins, 'Tele Satellit' European satellite magazines, Lockheed missile and space press releases, SCDXers newsletters and 'Aviation Week & Space Technology Digests'.

A bonus on the BBS are two online databases: AFAD Australia-wide frequency database plus a 1963-1993 satellite database.

SATCOM also offers financial users the ability to send and receive Internet e-mail. Even better, Paul says that plans are afoot for live Internet connection in the near future.

You can connect to SATCOM BBS on two phone lines, 24 hours daily: (02) 905 0849 and (02) 905 7694. Registration for basic access is free (after you supply your name and contact details) and permits you 20 minutes online time daily, during which you can download up to 300k worth of radio and other files. For an annual fee of only $20, however, users can extend their allowed daily access time to a full hour, and their downloading limit to a hefty 2 megabytes.

And what about Paul Britton himself? Well, he does get involved in a few other things besides running a computer bulletin board service and listening to the radio. For one, he has a special interest in flight simulator software and carries on SATCOM BBS all the relevant utility and extra scenarios, aircraft and the like, that can make this hobby a lot more fun.

To earn a crust, however, Paul stays on the ground and works as an information technology engineer, working for a publishing company. He's married and has a five month-old son who seems bent on following in Dad's electronic footsteps... if Paul doesn't watch him, he confiscates the nearest keyboard and attempts a little informal 'programming' on SATCOM BBS!

A list of radio-related computer BBSs

Okay, now let's gradually draw to a conclusion by looking once again at the specialist radio-orientated bulletin board systems you might want to investigate via your modem:

In Melbourne, **TBSA Radio BBS** is online 24 hours daily on (03) 9455 1309, catering for amateur radio and packet enthusiasts. The (Victorian) **Fox's Lair BBS**, also catering for the amateur crowd, is reachable on (03) 9888 7741.

The **Radio Shack BBS** offers a wide range of radio info, for amateur operators, SWLs, medium wave DXers and scanner enthusiasts on (03) 9532-5737. And **AMNET BBS** in Melbourne aims its service towards amateur radio operators on both (03) 366 7055 and (03) 366 4976.

In Sydney, try both **SATCOM BBS** on (02) 905 0849 and (02) 905 7694 for satellite DXing software, as noted above, and the original **SHORTWAVE POSSUMS BBS** on (02) 651 3055.

Three more BBSs around NSW include VK2EHQ's **Mountain System BBS** on (043) 73 1232, **Blue Satellite BBS** on (043) 40 4851. **Vulcan's World Astro/Space BBS** on (02) 635 1204.

In Brisbane ring the Queensland version of **The Fox's Lair** (no relation to its Victorian namesake) on (07) 3803 6821.

The Shortwave Possums BBS disk offer

What? Don't tell me! *Still* got no modem? Can't ring your local BBS and download interesting radio-shareware? Never fear! I've temporarily revived the old **SWP DISK OFFER**, due to popular demand. Send your cheque for $35 plus six formatted floppy disks to this address:

Shortwave Possums BBS
attn: Patrick McDonald,
PO Box 357,
Round Corner,
NSW 2158

The possums and I will fill your disks with up to eight megabytes of the latest radio-orientated shareware software and post them back to you toot sweet!

But that's enough from me for now... e-mail me at patrick@mpx.com.au with your suggestions and/or comments for ONLINE or use snail mail at the above address. I'd love to hear from you... bye for now!

Patrick Mc Donald looks at what communications-type software is available on the Bulletin Boards...

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CB Antenna Construction	$3.00

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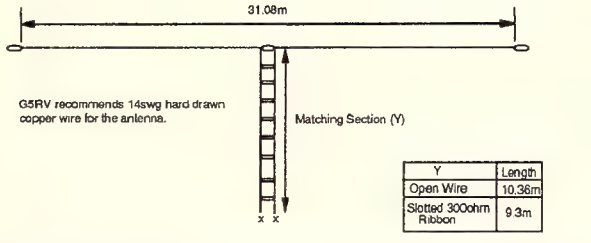
G5RVs of all sizes

By Steve Ireland, VK6VZ/G3ZZD

The most famous HF multi-band antenna for radio amateurs in use in my birth place, the United Kingdom, is undoubtably the 'G5RV'. Originally designed by Louis Varney, G5RV, in the 1960s, it is a brilliant design.

Without using lossy parallel-tuned circuit 'traps', the original antenna is designed to work as a dipole type of antenna on the 3.5/7/14/21/28 MHz amateur bands[1]. As can be seen from **Figure 1**, the basic antenna is made entirely from wire — including some 300 ohm slotted ribbon or open wire feeder, plus a little 75/50 ohm coaxial — and is easily constructed by the greenest of radio enthusiasts.



Y	Length
Open Wire	10.36m
Slotted 300ohm Ribbon	9.3m

Antenna is fed at point x x with ATU or random length of RG11 75 ohm/RG213 50 ohm co-axial. If an ATU with a balanced output is used, open wire feeder may be used all the way from the centre of the antenna to the ATU.

Figure 1 Original G5RV multi-band centre fed dipole for 80-10m

Some 30 years later, the G5RV antenna's UK popularity is still enormous and it is justifiably famous around the world. Recently, a local amateur heard a VK2 working into Venezuela, South America. The VK2 was such a strong signal that the Venezuelan asked him what kind of beam antenna he was using.

"No beam antenna here mate, just 400W and a G5RV dipole up 13 metres," came the reply. The YV5 was very impressed.

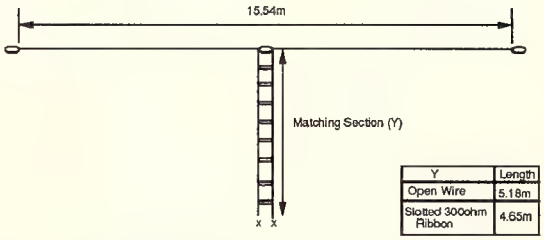
The principles used by Louis Varney in the original G5RV dipole can be extended to larger and smaller versions of the antenna. Some people may have heard of the half-sized G5RV. It was mentioned by the master himself in updating the original antenna about 10 years ago[2], showing how it will work on the so-called WARC bands (10/18/24MHz).

Most people who know the half-sized G5RV (**Figure 2**) think of it as as a dipole type of antenna covering the 7-28MHz bands. However, being *half* the size of the original, it should also work on the 52MHz (6m) amateur band with an ATU[3], giving a comparable performance to its big sister on the 28MHz band.

On 6m, the half sized G5RV antenna would need to be fed with a matching section made of open wire feeder to keep RF losses down, but it should show some fair gain and directivity. Each half of the antenna is three half-waves in phase and, to quote from G5RV himself[4], talking about using 28MHz on the full size antenna:

"The polar diagram is similiar to that of a 3/2 'long wire but with even more gain over a /2 dipole due to the collinear effect obtained by feeding two 3/2 antennas, in line and close proximity, in-phase."

The half-sized G5RV on 6m is likely to display some reactance at its feed point, but with a suitable ATU a 1:1 SWR should be obtained. These days, with HF transceivers coming onto the market fitted with 6m, it could make a very cheap bi-directional beam for 'six'!



Y	Length
Open Wire	5.18m
Slotted 300ohm Ribbon	4.65m

Antenna is fed at point x x with ATU or random length of RG11 75 ohm/RG213 50 ohm co-axial. If an ATU with a balanced output is used, open wire feeder may be used all the way from the centre of the antenna to the ATU.

Figure 2 Half sized G5RV multi-band centre fed dipole for 40-10m

Double and win!

Another much less known variant is the double-sized G5RV, which provides a good antenna from 1.8MHz to (at least) 14MHz. VK6LW and myself have been using antennas of this type for LF DXing for the last eight months with great success — and, in my experience, the antenna also works well up to 30MHz!

While the original G5RV is designed to give its best match (and arguably best performance) on 14MHz, where it is a three half-waves center-fed antenna, the double-sized G5RV will provide similar performance on 7MHz.

On the known principle of a antenna working equally well on the third harmonic of its design frequency, it provides an excellent match and a 'killer' signal on 21MHz for VK6VZ.

However, the major advantage of this antenna is that it can provide a dipole antenna on 160m within a relatively small span — my antenna is squeezed into around 160 feet, with 22 feet of wire at each end dropped down vertically! Those sceptics who think this might work, but can't be much chop as a DX antenna have got a surprise coming!

In three months of operation (January to March 1995), with the antenna up at about 13m above the ground, 29 countries in five continents (Oceania, Africa, North America, Asia and Europe) were worked on 160 metre CW/SSB. Currently, the US states contacted using my double-sized G5RV stands at 31, stretching from Maine (KA1PE on the long path) to California.

The antenna is also a spectacular performer on 80 and 40

....☞

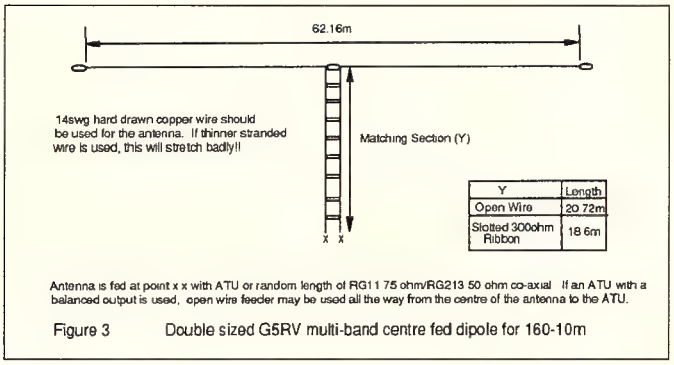

62.16m
14swg hard drawn copper wire should be used for the antenna. If thinner stranded wire is used, this will stretch badly!!
Matching Section (Y)
Y
Length
Open Wire
20.72m
Slotted 300ohm Ribbon
18.6m
x x
Antenna is fed at point x x with ATU or random length of RG11 75 ohm/RG213 50 ohm co-axial. If an ATU with a balanced output is used, open wire feeder may be used all the way from the centre of the antenna to the ATU.

Figure 3 Double sized G5RV multi-band centre fed dipole for 160-10m

metres, with many excellent DX and local contacts. VK6LW has a single band delta loop for 40 metres at around the same height as the double-sized G5RV and, although the former is a better DX antenna, anything he works on the delta can usually be worked on the latter.

VK6LW is a serious LF contester and has tried all kinds of vertical antennas on 'top band' — with masses of radials — but finds at his tree-covered location that his double-sized G5RV (in an inverted vee configuration at 25 metres high!) is the best 160 metre antenna he has used. The double-sized G5RV is shown in **Figure 3**.

Some pitfalls

The G5RV and its little and big sisters are like all antennas — the higher they are, the better they work. As with most multi-band antennas, they are very attractive to radio enthusiasts with limited space and resources.

However, the fact of the matter with a multi-band antenna of any kind is that it is a compromise. If you want it to work well, it's got to be as high in the air as possible.

When I was first licenced as G3ZZD, one of the first antennas I used was a G5RV. It dangled between two wooden poles, about 20 feet high and as a DX antenna was a waste of time.

Another local amateur used to get better reports and work far more DX than me, using an identical G5RV antenna — we even bought the wire and feeder from the same shop — and, at the time, I just couldn't understand it. Then, one evening an 'old hand' at the local radio club took me to one side: "Twice the height, twice the DX, that's the rule of thumb," he said.

After that I went away and looked in a few antenna books. While the 'rule of thumb' explanation was not entirely scientifically correct, I could see what he was driving at — the angle of radiation from my rival's 40 foot high antenna was much lower than mine, particularly on the higher bands.

I guess the VK6VZ rule of thumb these days is this: "Don't put up a compromise antenna at a compromise height!"

Another potential pitfall with the G5RV is the matching of the antenna, particularly if you have a solid-state transceiver without an ATU.

As G5RV himself notes[5] of his original design: "...although the impedance match for 75 ohm twin lead or co-axial cable at the base of the matching section is very good on 14MHz, and even the use of 50 ohm co-axial cable results in only a 1.8:1 SWR on this band, the use of a suitable ATU is necessary on all the other HF bands ... also to satisfy the stringent load conditions demanded by such modern equipment employing an ALC system which 'senses' the VSWR condition presented to the solid-state transmitter output stage, to protect it from damage which could be caused by a reactive load having an SWR of more than about 2:1..."

The best thing to do is to use the antenna with a true balanced to unbalanced ATU, such as the RSGB Z-Match[6] or G5RV's own version of the Z-Match[7]. However, there is another way to get a good match on two bands without using an ATU, provided you don't mind a bit of experimenting.

Don't use ordinary 300 ohm ribbon to feed the antenna. When it rains, the SWR will go crazy and the losses on the high HF bands will be enormous! Slotted ribbon is okay (I use it) but in the rain the SWR will still go 'off' a little. Open wire is the best way to go — see any good antenna book for how to make it!

Stub matching

When I first put up my double-sized G5RV, I simply fed it with a 60' section of 300 ohm slotted ribbon, via a T-match type ATU. Although this an unbalanced-to-unbalanced ATU, the antenna is so low to the ground relative to a wavelength on 1.8/3.5MHz and even 7MHz that it really doesn't seem to affect the antenna's radiation much by giving it an unbalanced feed.

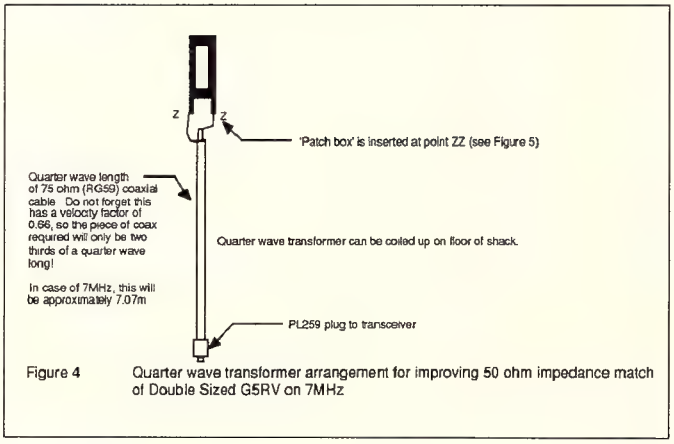

Z
Z
'Patch box' is inserted at point ZZ (see Figure 5)
Quarter wave length of 75 ohm (RG59) coaxial cable. Do not forget this has a velocity factor of 0.66, so the piece of coax required will only be two thirds of a quarter wave long!
In case of 7MHz, this will be approximately 7.07m
Quarter wave transformer can be coiled up on floor of shack.
PL259 plug to transceiver

Figure 4 Quarter wave transformer arrangement for improving 50 ohm impedance match of Double Sized G5RV on 7MHz

However, after a while, most of my operation became centred on 1.8MHz and 7MHz and I started to search for a feed system that would do away with the ATU on those bands. This would do away with the nuisance of having to constantly re-tune the ATU, as I often moved rapidly between these two bands, chasing DX stations.

The impedance of the double-sized G5RV on 7MHz proved to be around 90 ohms at the bottom of my 18.6m matching stub. As I use 50 ohms as my basic station input impedance (my transceiver is optimised for a 50 ohm output, my SWR bridge is a 50 ohm type, etc) what I needed was a 2:1 impedance transformer for a near perfect match.

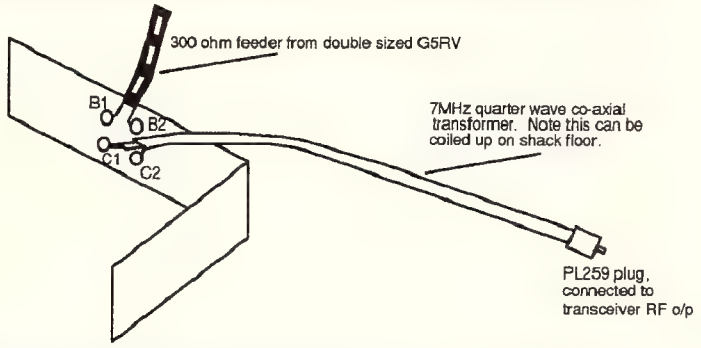
What I used is something that those of you who read my *Superior Dipoles* article in last month's *Radio and Communications*[8] will be familiar with — the quarter wave matching transformer made from 75 ohm co-axial. Constructional details are given in **Figure 4**.

The rest of my matching system was simple — I attached the quarter wave transformer and adjusted the length of the 18.6m length of 300 ohm ribbon used to feed the antenna until the SWR was around 1:1 on my favorite 7MHz frequency (7005 kHz). The length of the ribbon was then noted — in my case an addition of 2.6m.

The length of the 300 ohm ribbon was adjusted again, until I had a 1:1 SWR on my favorite 1.8MHz frequency (1825 kHz), taking care to watch how much I trimmed/added — in my case a reduction of 3.6m from the 7MHz optimum length.

Diagram shows two sides of plastic box (from Dick Smith Electronics or similar).
B1, B2 and C1, C2 are 4 banana plug sockets. When using 7MHz, a 3.6m length of 300ohm ribbon is connected between B1, B2 and C1, C2, using banana plugs. On 1.8MHz, B1, B2 and C1, C2 are connected using a very short length of 300 ohm ribbon (approx. 5cm), using banana plugs.

When antenna is used on other bands, a short length of 300 ohm ribbon is used to connect the B1 and B2 sockets (i.e. antenna feeder) to ATU output. C1 and C2 are not connected to B1 and B2!


300 ohm feeder from double sized G5RV
B1
B2
C1
C2
7MHz quarter wave co-axial transformer. Note this can be coiled up on shack floor.
PL259 plug, connected to transceiver RF o/p

Holes are drilled in the side of the box for cable entry. The use of the patch box helps to ensure RF connections are secure and away from prying fingers! 300 ohm feeder is soldered to B1 and B2, while 7MHz quarter wave transformer is soldered to C1 and C2.

Figure 5 1.8/7MHz 'patch box' for Double sized G5RV

A separate length of 300ohm ribbon 3.6m long was prepared and the 300ohm feeder of the double-sized G5RV cut back to the optimum length for 1.825MHz, ie 17.6m. When I want to operate on 7.0MHz, the extra 3.6m length is simply inserted between the 7MHz quarter wave matching section and the 300 ohm feeder, using 4mm 'piggy back' banana plugs.

The 7MHz quarter-wave transformer is left in circuit on both 1.8MHz and 7MHz.

If you try this idea, you may find you need slightly different lengths of 300 ohm ribbon than the ones I used to achieve the best 1.8/7MHz match. The lengths will also depend on what your favorite 1.8/7MHz frequencies are!

A crude 'patch box' was constructed, along the lines of **Figure 5**. The arrangement allows me to change bands from 1.8MHz to 7MHz within a few seconds and have a great match at the end of it. Neat it isn't, but very cheap and effective is most certainly is!

This idea could be used to provide a perfect match on the original G5RV for 3.5/14MHz, or on the half-sized version for 7/28MHz. When the antenna is used on the other bands, the quarter-wave coaxial matching transformer is discarded and the antenna fed via an ATU attached directly to the 300 ohm slotted ribbon/open wire feeder.

Final thoughts...

Any of these variants of the G5RV will provide excellent performance, particularly on 14MHz (original version), 7MHz (double-sized) and 28MHz (half-sized), where the antenna will show some amount of gain over a dipole and a low angle of radiation, provided it is mounted close to a half-wave high.

The double-sized G5RV is a genuinely good performer on 1.8MHz, providing mostly high-angle radiation but DX capability in a relatively small space.

Those with an interest in 28/54MHz might be interested in trying a half-sized G5RV antenna. For those with a really tiny garden, even a *quarter*-sized one (7.76m top) should provide good results on 14/28/52MHz (and possibly on 21/24MHz) if it is fed with open wire feeder via an ATU and elevated to at least 10m in height.

Now, there's some food for thought for the next sunspot maximum!!

References/notes

[1] The G5RV was invented back in the days of valve power amplifiers when, if your SWR was between 2:1 and 3:1, nobody worried too much. Unfortunately with the advent of transistor power amplifers which couldn't cope with this level of SWR, an aerial tuning unit became essential if you wanted to use a G5RV on all the HF bands it covered.

[2,4,5] *The G5RV Multi-Band Antenna* by Louis Varney G5RV, Radio Communication (RSGB), July 1984 issue.

[3] S.E.M. in the UK (8 Fort William Head Road, Douglas, Isle of Man) makes a 2m or 6m Transmatch which it claims will 'match anything' on VHF, including a G5RV. In the past, I have seen designs for VHF Transmatches and Z-Matches in magazines.

[6] Radio Communication Handbook (4th Edition), published by the RSGB, 1968, page 13.37

[7] *An improved Z-Match ASTU* by Louis Varney, G5RV, Radio Communication (RSGB), October 1985 issue

[8] *Superior Dipoles* by Steve Ireland, VK6VZ, Radio and Communications (us!), August 1995 issue.

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Packet

By John Day, VK3ZJF

Over the last two months we have looked at the basics of the AX.25 protocol and its internal structure. Whilst I did mention last month that we would have some software for you this time, my other commitments have precluded this being ready in time, so we will continue our discussion of protocols and get back to software later.

This month we are going to delve inside the AX.25 frame and see exactly how it is made up. To do this I needed to get some 'raw' AX.25 frames. Most TNCs include a TRACE command of some sort. At home I use a Kantronics KPC-3 controller and I used the TRACE command to capture the data used in the 'Anatomy of a Packet' which I have prepared for you this month. Hopefully this graphic summarises a lot of the information we have discussed in the last month or three.

Each essential part of the frame is pointed out and the information boxes relating to each part give you more information on each specific item. Rather cleverly, the folks at Kantronics have broken the trace output by inserting a space after every seven bytes of data, rather than the more obvious eight. This is because an address (or callsign if you prefer) in an AX.25 header is seven bytes long. This makes it easier to look at a frame trace output and understand what is happening.

Protocol Identifiers

So far we have only dealt with frames having a protocol identifier (PID) of 'F0' which, in AX.25 terms, means 'no level three protocol present'. Although by no means exhaustive, here is a list of commonly encountered PIDs.

C4	Link quality protocol
CA	Appletalk
CB	Appletalk ARP
CC	IP (Internet Protocol)
CD	ARP Address Resolution Protocol
CF	NET/ROM
F0	No level three protocol

On any packet channel it is likely that you will see F0 and CF fairly commonly. In areas where ROSE is used you should see other PIDs associated with its operation. But as we have no ROSE in Victoria and neither have I ever seen a standard for the protocol, I have been unable to add the PIDs it may use.

Any channel which is active with TCP/IP traffic will show the CC and CD PIDs of the Address Resolution Protocol and Internet Protocols fairly heavily, as will the CF of NET/ROM occur as it is often used with TCP/IP for routing over NET/ROM-based infrastructures.

What are NET/ROM and ROSE?

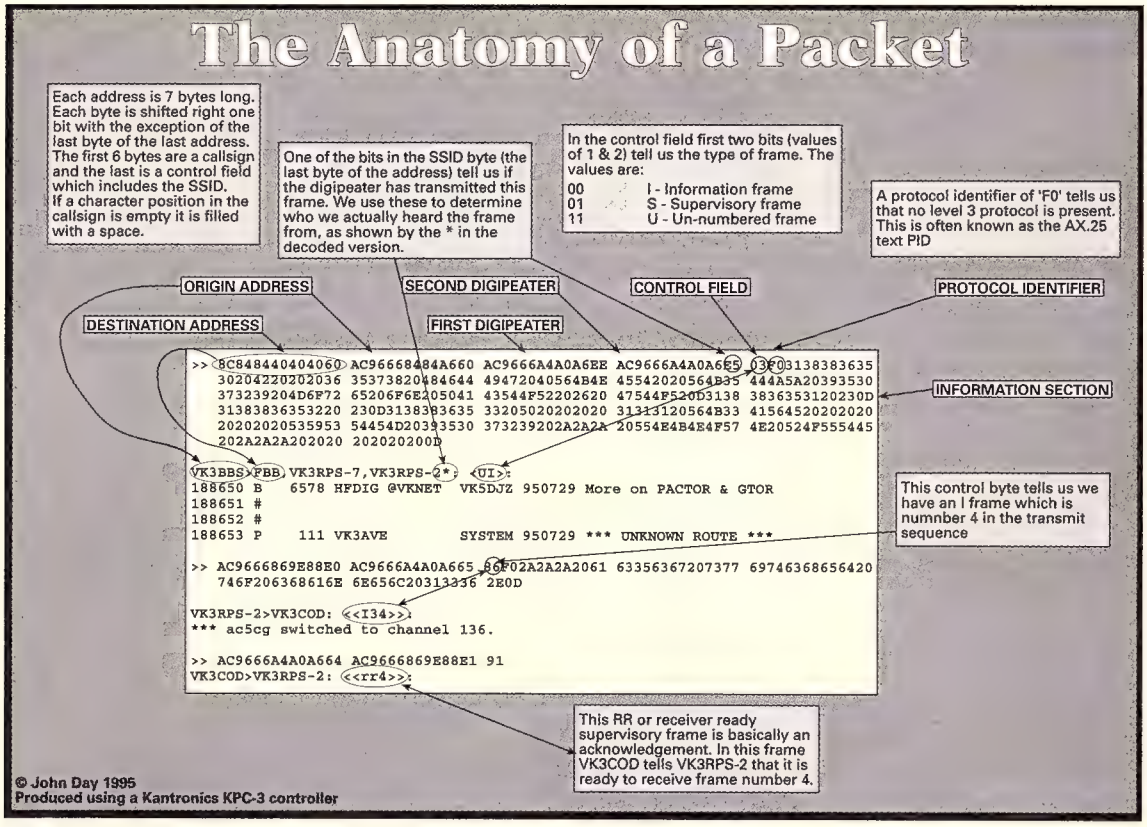
When AX.25 was devised in the early 1980s the initial standardisation effort went into establishing a viable and serviceable Link Layer (Level 2) protocol. The question of the Network Layer (Level 3) was left open for discussion.

Network layer management has always been a difficult proposition. In part, the reason something as pervasive as AX.25 has not appeared, is due to the complexity of network management and the lack of sophisticated infrastructure in the amateur packet community. Eventually, two workable protocol products reached the market. From the Radio Amateur Teleprinter Society (RATS) came the RATS Open System Environment, and from software company Software 2000 came NET/ROM.

Both of these products are intended to use the basic TNC-2 hardware as their base, and both provide automatic routing services within the confines of a series of packet routers running the same protocols. In either case it is possible to connect to the router, and then to any number of other stations without having to know where they are, or how to reach them... just let the network layer do the necessary work.

Naturally both of these products have good and bad points. ROSE is rather restricted in its application. To the best of my knowledge it is not supported by any networking systems other than itself. When ROSE is installed in a digipeater site and becomes part of a ROSE network it can carry other traffic, but it is not capable of integrating itself into a larger network.

NET/ROM, on the other hand,


The Anatomy of a Packet
Each address is 7 bytes long. Each byte is shifted right one bit with the exception of the last byte of the last address. The first 6 bytes are a callsign and the last is a control field which includes the SSID. If a character position in the callsign is empty it is filled with a space.
One of the bits in the SSID byte (the last byte of the address) tell us if the digipeater has transmitted this frame. We use these to determine who we actually heard the frame from, as shown by the * in the decoded version.
In the control field first two bits (values of 1 & 2) tell us the type of frame. The values are:
00 I - Information frame
01 S - Supervisory frame
11 U - Un-numbered frame
A protocol identifier of 'F0' tells us that no level 3 protocol is present. This is often known as the AX.25 text PID
ORIGIN ADDRESS
SECOND DIGIPEATER
CONTROL FIELD
PROTOCOL IDENTIFIER
DESTINATION ADDRESS
FIRST DIGIPEATER
INFORMATION SECTION
This control byte tells us we have an I frame which is numnber 4 in the transmit sequence
This RR or receiver ready supervisory frame is basically an acknowledgement. In this frame VK3COD tells VK3RPS-2 that it is ready to receive frame number 4.
© John Day 1995
Produced using a Kantronics KPC-3 controller

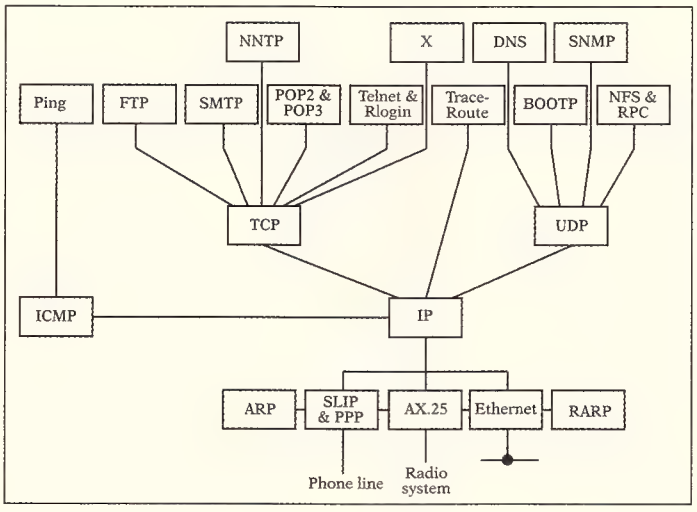
has been widely imitated. Such alternative products as 'The Net X1' which combines the functionality of NET/ROM and a TCP/IP switch in one firmware product for the ubiquitous TNC-2 controller, the PC-Node software for the IBM-PC from John Wiseman, G8BPQ, the NET/ROM support provided for the NOS TCP/IP package by Dan Frank, W9NK and the newly-released K-NET facility for the Kantronics KPC-9612 dual-port TNC, are examples of how widely spread the NET/ROM phenomenon is.

Both ROSE and NET/ROM are in widespread use in this country. ROSE seems to predominate in VK2 and VK5, whilst NET/ROM certainly has a stranglehold in VK3 where TCP/IP activity seems to predominate.

The overall scheme of things

When we contemplate the overall scheme of the packet world we begin to realise that our world has been restricted by our ability to do exciting things. Recently we have been introduced to another phenomenon which is taking the packet world, and the rest of the world, by storm — the **Internet**!

In the late 1990s we are suffering from a new problem: convergence. What was once a unique property of the amateur packet system — low cost digital communications — is now available to everybody. So amateurs are facing the fact that their uniqueness is disappearing. So we have to realise that, in fact, we have something very useful to ourselves, and to the rest of the world.



For a long time we have been told by many (but never by yours truly!) that TCP/IP is a dinosaur which attracts only Unix nerds and that there must be better ways of communicating around the world. Well think again! TCP/IP is the protocol stack of the Internet, and we as amateurs (at least those with some TCP/IP experience) are in a great position to capitalise on just what is happening in the Internet.

So where do we fit in? Look at the illustration on this page and you will see.

Over the next few months we will look at these protocols and see how they work and how they relate to both the amateur packet radio system and the Internet world as well.

73s de John, vk3zjf@vk3blw; CIS 100236,2364 or email dayj@ozemail.com.au

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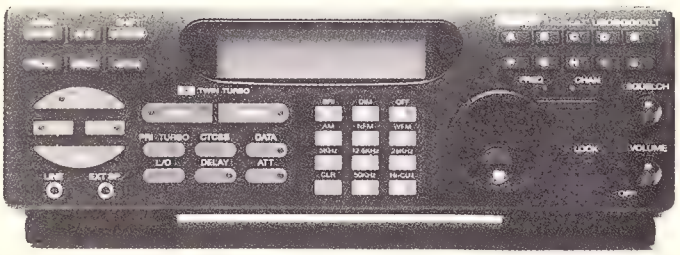

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In Flight

with Bob Bell

HF aviation monitoring is extremely popular, particularly on the worldwide MWARA network of frequencies, and LDOC, or Long Distance Operational Control channels. MWARA frequencies are used by ATC, and LDOC are operated by airline companies.

Between the two series of networks, monitors can have a ball listening to aircraft flying all over the world, airliners they will perhaps never get to see here in Australia.

The east coast Australian international HF aeronautical station operated by Flight Service Officers from the CAA was 'Sydney Radio', located at Sydney Airport, with transmit/receive antennas in western Sydney near Llandilo.

Late last year the CAA decided that this operation was to be relocated to Brisbane, and the callsign changed to 'Brisbane Radio' by May 1, 1995. This did not happen. However, by the time you read this article the change should have been made, some time during August.

During the year, requests from myself to the CAA for a precise changeover date were not given specific responses. I'm not sure what held up the move, and at one stage I was indeed wondering if it had been placed on the back-burner. The logic behind the relocation of the SP-6 frequency family is to align the International HF SP-6 operation with the move to Brisbane and Melbourne of a large proportion of the Flight Service and ATC staff away from other capital city areas. Brisbane and Melbourne are now the two primary ATC centres for the entire Australian mainland.

It would appear that the domestic HF operation from 'Sydney Radio' will remain intact, at least for the time being.

'Brisbane Radio' international HF frequencies that make up SP-6 (South Pacific) are 3467, 5643, 8867, 13,261 and 17,904 kHz. All frequencies are utilised in upper sideband mode. Tune them and enjoy hours of great flight deck monitoring. If you haven't monitored HF aeronautical radio before, it will certainly cause you to start searching the MWARA frequencies from much further afield, like the North Atlantic (NAT) families.

Satellites...

"What's happening with aviation satellite usage?" I hear you say. The latest news hot off the press is America's Delta Airlines is equipping 45 aircraft with satellite air comms, including MD-11s, Boeing 767s, and L-1011 Tristars.

The satellite installations will provide both voice and data connectivity to the flight deck and, in conjunction with Delta's cabin equipment provider Claircom, will provide passenger communication services. The aircraft are being fitted up with Honeywell/Racal satellite transceivers, matched to King SAT-48 low profile antennas.

Russia's Aeroflot has also started to satellite-equip its Boeing 767s and Airbus A310s, using single-channel equipment in the first stage of the program. Passenger telephones will be installed in First and Business Class seats only. Taiwan's carrier, Eva Air, already has 13 aircraft SatCom equipped, comprising three MD-11s, two Boeing 747-400s, and eight Boeing 747 Combis (which carry some cargo containers on the main deck, behind the passenger areas).

But where are we in terms of the bigger picture? When will SatComs start to erode our favorite HF frequencies?

Well, the InMarSat Aeronautical System is set for major developments within the next two years. By 1997, InMarSat will be able to offer satellite communication services to meet both the ATC and company needs of the majority of the aviation community. The existing Aero-C, Aero-H, and Aero-L services will be joined by Aero-I, coinciding with the next generation of InMarSat satellites, the InMarSat-3s.

Currently, there are 967 satellite voice and facsimile channels available purely for use by commercial airline operators, and a further 292 channels in existence solely to be used for data transmissions. It gives us a total of 1,260 satellite channels available right now. By the year 2000, SatComs will have taken over from HF as the primary reporting medium, with HF utilised only as backup systems.

Most of the recently-fitted SatComs equipment to airliners has been 6-channel equipment, with five of those channels being voice, and the remaining single channel devoted to data transmissions.

At this point in time, ACARS transmissions are being sent regularly through InMarSat over mid-ocean by airlines such as Qantas, Cathay, and United, with the satellite transmissions paralleling their HF reports back to Flight Service or ARINC ground stations.

With an InMarSat monitoring setup, as detailed by myself (VK2UTG) and co-writer John Wilson (W4UVV) in both 'Listening In' and 'Climb into the Cockpit by Radio' recently, you can monitor both voice and ACARS digital data transmissions from InMarSat-Aero. (See the end of this article for more information).

Drama in the sky...

And speaking of exciting HF monitoring, there was plenty of that happening when 'United 815', a Boeing 747-400 airliner, was 10 hours out of Los Angeles on its way to Sydney.

Sydney Radio (now 'Brisbane Radio') was called on HF 5643 kHz by United 815's skipper, who requested a phone patch through to United Operations in Sydney.

Following that radio-telephone conversation (not monitored, of course, due to illegality!) and subsequent calls on 3467 kHz that were monitored from the airliner through to Sydney Radio, it became apparent that the crew had detected the presence of some kind of suspicious device, shaped like a transistor radio, with wires sticking out of it, under a passenger seat.

The lady sitting in that seat, Sarah Richey, 34 years of age, from Seattle USA, had absolutely no knowledge of the 'radio', and had seen no one place it under her seat.

America's notorious 'Unabomber' had, the day before, threatened to blow up an airliner out of LAX, and as such the suspicious device was regarded very seriously. United 815 requested from Sydney Radio at about 4am local time all emergency services to attend their arrival, and the device was picked up and transferred to the rear of the aeroplane and literally smothered in spare passenger blankets, pillows and the like.

When the aircraft was just two hours out of Sydney destination, the Captain came on the cabin PA with these words: "Ladies and gentlemen, I need your 100 per cent attention. We have

Bob Bell takes us aloft with his aviation monitoring column...

found a suspicious device on board, which we believe to be explosive. It's in the form of what appears to be an AM/FM radio, and has a piece of wire sticking out of it. If you know anything about this 'radio', can you please contact a member of the flight crew immediately." But no one did.

Regardless, the 327 passengers were kept in a very calm state of mind by a very professional crew of 20 personnel on the flight deck and in the cabin.

The airliner continued on to Sydney to make a pre-curfew emergency landing at 5:42 am local, which resulted, I am told, in a spontaneous round of cheering and applause. The passengers were quickly de-planed after the jumbo was taxied to a remote part of the airport along the little-used RW 25. Bomb Squad officers worked on the device for about three hours before declaring it 'safe'.

Every aviation monitoring enthusiast who had 'tuned in' on the inflight drama knew one heck of a lot more than any single passenger on the actual airliner involved in the emergency, I'll tell you! It was riveting listening, and showed everyone that our emergency contingencies are well thought out and do work. Well done United, and everyone else involved!

United Airlines craft utilise the services of ARINC (Aeronautical Radio Incorporated) within USA airspace to contact the company.

Three main ground stations are San Francisco, Honolulu, and New York. The frequencies for those stations are: SFO: 3013, 6640, 11,342, 13,348, 17,925 and 21,964 kHz (all USB). HNL uses the same frequency family. JFK uses all except 11,342 kHz.

Out of US airspace, United will utilise other networks, such as Sydney Skycoms, which operates on 5160, 8140, 9040, 11,132, 17,440, 20,160 and 23,070 kHz, plus numerous other discrete frequencies which will be assigned after initial contact on these nominated frequencies.

Feedback...

John Principal from Port Augusta has written to me wanting to know the locations of several oceanic waypoints he has heard mentioned on the International SP-6 frequencies.

'GULNA' is at 34°35.9' south, 154°05.1' east, while 'IDOTI' is located at 11°31.6' south, 153°36.0' east. Finally, 'PULAK' is position 28°42.1' south by 163°26.5' east. Hope that helps you out John.

There are many more than those few waypoints.

On board navigation computers are pre-programmed with the actual latitude and longitude co-ordinates for every waypoint in the world, and the flight crew merely has to key in the mainly five-letter waypoint code names to program in the route.

The computer then matches the waypoint names to the exact positions to be flown to. Naturally, most of these oceanic waypoints are just that — waypoints only, with no landmass anywhere nearby. If you were planning on stopping over at 'LOTRA' John, may I suggest some flotation gear, and that you bring along some shark repellent!

I'll join you on the flight deck next issue. 'Til then, if I have whetted your aviation-monitoring appetite and you want more, 'Listening In' magazine ($8.00 inc post) and my new book 'Climb into the Cockpit by Radio' ($22.95 inc post) are available from Airband Communications, PO Box 16, Georges Hall, NSW 2198. Bankcard, Visa and Mastercard welcomed. See you next month.

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MFJ-451
MFJ-498
Morse keyboards

Reviewed by Paul Butler, VK3DBP

A couple of interesting devices came my way the other day, courtesy of Daycom Communications — the **Morse Keyboard** and the **Display Keyboard Keyer**, both from MFJ Enterprises in the US. Their arrival was well timed, since the issue of Morse Code and its role in amateur radio has recently been debated quite hotly in Radio and Communications' forerunner magazine, Amateur Radio Action.

Having learned Morse for the AOCP examination, I have done little with it over the years. So I was considering whether I should get myself back up to speed and see what was happening in Morse on the amateur bands. I have seen computer programs for Morse training and played around with a variety of Morse decoder computer interfaces for transmission and reception of Morse Code.

But the concept of a Morse keyboard was new to me. Do it teach Morse? Can it receive and decode Morse? What exactly does it *do*? Well, here are some answers to these and other questions about Morse keyboards, based on my experiences with a pair of them from MFJ.

What is a Morse keyboard?

A Morse keyboard consists of a normal computer keyboard and an interface, a box of electronics which joins the keyboard to the transmitter. And no, it does not decode received Morse Code — it takes characters typed at the keyboard, translates them into Morse and keys the transmitter accordingly.

These keyboards are typically used during contests, to ease the workload on the amateur operator who is trying to keep up-to-date records of as many contacts as possible in the time available. It can send CQs, provide pre-recorded information and acknowledge contacts in semi-automatic mode (ie the operator must be in control of the system but many of its functions can proceed automatically once initiated).

To operate the MFJ devices, just about any computer keyboard will do the job, as long as it is IBM-AT compatible (MFJ warns that an XT keyboard or a switchable keyboard on the X setting may damage the interface). Keyboards were supplied with the review units but it is possible to buy them without a keyboard if you have one lying around and want to save a bit of money.

The MFJ interfaces can be powered by a standard 12V DC mains plugpack, which must be able to supply at least 250mA. The use of an external power supply certainly keeps the size down but adds yet another plugpack to the collection necessary for the average computer-assisted amateur shack. An alternative is to use a beefy power supply and connect *all* your devices to it — this only works, of course, if they all have the same voltage requirements.

The MFJ interfaces are not huge by any means. The simpler of the two, the MFJ-451, is tiny, with a front panel which is only 85mm by 33mm and a box measuring 110mm from front to back. The deluxe MFJ-498 has a built-in display on the front panel and so is larger, 165mm by 60mm at the front and 150mm deep.

From the interface, a cable runs to the keying socket of the amateur radio transmitter. Another warning from MFJ here — some transmitters are positive keyed; that is, a positive voltage relative to ground is used to turn on the transmitter. Others are negative keyed, so you must be sure about which you have before connecting a keying interface.

Consult your transmitter manual carefully, then choose the DIRECT socket on the MFJ interfaces for positive keying, the GRID BLOCK socket for negative keying. These sockets are RCA style, while the keying input on the transmitter usually requires a jack plug, so you will have to make your own cable using shielded cable or buy a ready-made one which matches your needs.

Having got the interfaces wired up and operating, let's have a look at the features of each one, starting with the simpler of the two.

The MFJ-451 Morse Keyboard

The front panel of this interface carries an ON/OFF switch, a volume control and a POWER light-emitting diode (LED). Although this warning LED has a BUFFER FULL label beneath it, there is no reference to this function in the manual and I could not make it respond in any way to indicate a full buffer. Perhaps this was a function planned by MFJ but not implemented.

The rear panel provides sockets for power, the keyboard and the connection to the transmitter. In addition, an external speaker may be connected, as well as an iambic paddle used as a straight key for sending Morse manually. The space bar on the keyboard can also be used as a key.

Turning the MFJ-451 on turns on the POWER LED and the internal sidetone oscillator produces the characters ON in Morse over the internal speaker, indicating that it is ready for use. Now any keypress on the keyboard will result in a character being sent in Morse to the speaker and to the keying output to operate the transmitter.

Typing faster than the sending speed results in characters being stored in a 200 character buffer until their turn comes to be sent. Mistakes can be deleted from the buffer using the Backspace key but the operator must keep track of progress since there is no display of the buffer contents. The Escape key clears the buffer and the Pause key temporarily stops the output so that extra characters can be inserted using the paddle or the space bar.

Instead of sending messages typed at the keyboard, the contents of either of two 100- character memories can be transmitted. This is accomplished by pressing function keys F6 for memory 1 and F8 for memory 2.

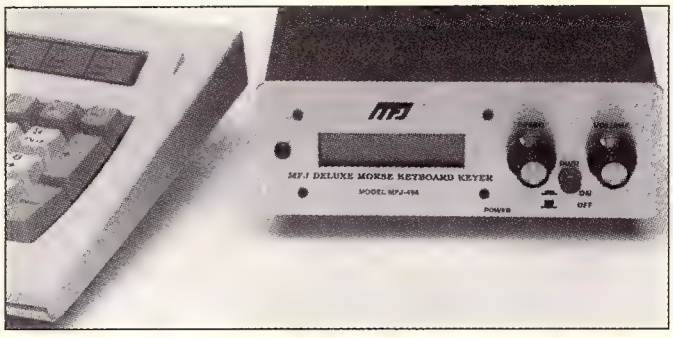
Messages are stored in memory by pressing F5 (for 1) and F7 (for 2), typing the message and pressing Enter to finish. So that you know when the buffer is nearly full, the sidetone oscillator plays back the characters as they are typed and its frequency drops once 90 characters are in the memory. Typing beyond 100 characters produces an error tone and these characters are lost.

A label on each function key would be handy, at least while getting used to the operation of the Morse keyboard. It would be extremely frustrating to press the wrong function key in the middle of a hectic Morse contest and have to retype the memory contents!

Special commands can be embedded in the message typed into a memory, as follows:

CTRL-L (press and hold CTRL and type L) causes a message to be repeated until Escape is pressed. This could be used for operating an unattended beacon, for example, which automatically sends its callsign and other information over and over again.

CTRL-P sends the message, waits a defined length of time, then sends the message again, repeating until Escape is pressed. This function can be used to send, for example, "CQ CQ CQ de VK3DBP" at regular intervals, freeing the operator to get on with other tasks until a reply comes in.



CTRL-S inserts a serial number into the message, which is incremented each time it is sent. This can be used during a contest to produce a unique serial number for each contact.

The other function keys allow code parameters to be adjusted. The sidetone frequency can be changed using F2. Sending speed is adjusted using F3 over a range from 5 to 100(!) words per minute. Function key F4 adjusts the weight, that is, it changes the length of each dot or dash without affecting the sending speed.

All parameters are saved in non-volatile memory which is rated to last more than 20 years — that should be enough for anyone!

The MFJ-498 Display Keyboard Keyer

This unit is similar in operation to its baby brother but offers many more features and functions. The most obvious difference between the MFJ-498 and the MFJ-451 is that the deluxe version has a 32-character, two-line liquid crystal display which shows what is going on during setting up and normal on-air operation. One line of the display shows what is being typed into the buffer, the other shows what is going out on the air.

The display has a control which can be adjusted to suit the relative position of the operator and the unit itself. This is needed because the liquid crystals rely on reflected light, the direction of which is quite critical. In practice, even with the adjustment available, the positioning of the unit was crucial, since a wrong angle of viewing rendered the display unreadable.

The MFJ-498 will send Morse Code at any speed between 5 and a blistering 100 words per minute. Weight and sidetone frequency are both fully adjustable. The external key can be an iambic or single lever (dual contact) paddle. A hand key mode is supported which temporarily disables all other features of the unit.

The type-ahead buffer can hold 150 characters — less than in the MFJ-451 — but there are eight 4000 character memories this time, each operating independently of the others. The number of memories makes the unit very workable but I wonder whether the full 4000 character capacity would ever be used — imagine typing in and editing a block of text this size, about 500-600 words, using a 32 character, one-line display! Embedded commands can again be inserted into the text.

So far, the MFJ-498 appears to be like the simpler MFJ-451 but with the display added. It has many more features, however, which make it well worth considering if you are in the market for a Morse keyboard. They include four code practice utilities, to be used off-air for learning or improving Morse, as follows:

• Random code generator: randomly sends characters from one of nine selectable groups or from any or all of the sets of alphabet, numbers, punctuation or prosign characters (prosigns are pairs of characters used for special functions during Morse Code contacts). Used in conjunction with the speed parameter, this feature makes the MFJ-498 invaluable as a Morse Code teaching aid.

• Random word generator: randomly sends whole words chosen from its extensive internal set.

• QSO simulator: allows you to have a Morse Code conversation (QSO) with someone else without even going on the air! Sending CQ in this mode produces a 'reply' from other stations; if no CQ is sent, the other station initiates the contact. The manual says "...the more you 'talk' to the keyer the more it will 'talk' back to you. You may even talk to simulated fashion models who are hams..." (!)

• Exam simulator: sends text the way it is sent in the (US) FCC Morse exam. This time you are listening to a conversation between two stations, so you can use the feature to strengthen your receiving ready for your own exam. You can also do this, of course, by monitoring signals on the real amateur bands but at least this will be machine-sent Morse and the signal will not keep fading at the critical moment.

Keyboard or not?

So there we have it, a quick run down on Morse keyboards, with particular reference to two MFJ models, the basic MFJ-451 and the fully-featured MFJ-498. Whether a Morse keyboard is something you need depends on how you spend your on-air Morse time. For a contest enthusiast, the keyboard approach would certainly free up some of the time during busy periods, when contacts are coming thick and fast. Maintaining the log could be done while the keyer is sending CQs or acknowledging a contact. One question, however: who gets the certificate, the human operator or the machine?

For an amateur who does not get involved in contests, the keyboard approach could make Morse conversations a little easier. For example, it is common to exchange details of location (QTH), transceiver, antenna and so on, and this information could easily be stored in a memory for easy retrieval. The chore of sending CQ on a quiet band could be taken over by the electronics, too.

The Morse keyboard does not decode incoming Morse, so for many amateurs with a computer in the shack, there may be a preference for a computer program which receives Morse as well as sending it. These programs are not infallible, of course, and often cannot cope with code sent by the human fist rather than by machine, even under good conditions.

The Morse keyboard is basically a labor-saving device which can make a Morse QSOs more enjoyable. Each individual must decide for themselves whether they need the help. If the answer is Yes, then the MFJ units reviewed are certainly up to the job.

The MFJ-451 costs just $195, while the MFJ-498 is $399. **R&C** thanks **Daycom** for the loan of the review equipment.

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Other new features include naming of memory channels, DTMF Auto-dial memories, and DTMF Message Paging with up to 6 alpha-numeric characters. A large range of accessory lines are also available for easier customisation of your transceiver.
The FT-11R comes with an FNB-31 600mA/H NiCad, belt-clip, approved AC charger, CA-9 charge adaptor cradle and antenna.

Cat D-3640

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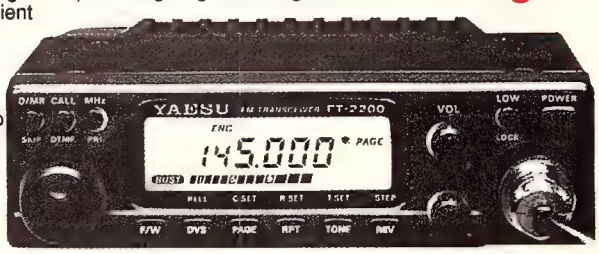

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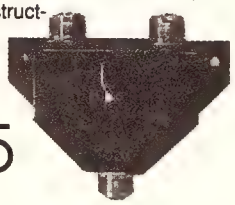

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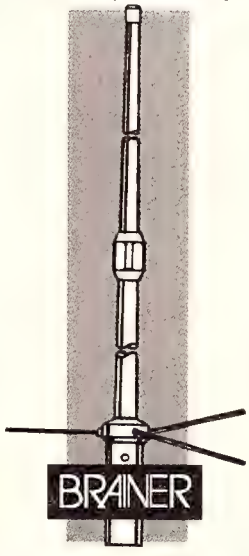

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4 x 5/8 wave (70cm)
Connector: SO-239 socket

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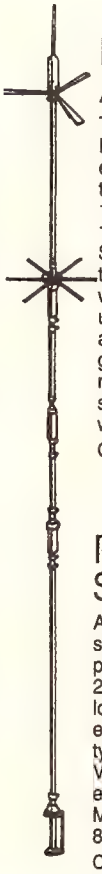
Cat. D-4830

2m/70cm GST-3

Frequency: 144-148MHz, 430-440MHz
Gain: 7.9dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Length: 4.4m
Type: 3 x 5/8 wave (2m)
7 x 5/8 wave (70cm)
Connector: SO-239 socket

$299

Cat. D-4835



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The SG-230 Smartuner - 'intelligently' - tunes any length antenna from 8-80ft! No preliminary tuning or adjustment is required, and the Smartuner will operate with any HF transceiver in the 1.6-30 MHz range and output power from 3 to 150 watts.

Smartuner automatically evaluates and switches 64 input and 32 output capacitance combinations, plus 256 inductance combinations in a "pi" network - over a half-million precision matches. Smartuner then remembers the chosen frequency and tuning values and automatically reselects those values - in less than 10 ms, each time you select that frequency.

Flexibility is a key Smartuner feature. It is available with a number of attractive options, including a shock mount for military and extreme applications, plus a 24 VDC option.

For maximum range, clarity and flexibility, with just about any HF-SSB, the SG-230 Smartuner is your smartest choice.

*Microprocessor Controlled, Precision, Automatic Antenna Tuning
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*Waterproof for All Weather
*B.I.T.E. (Built In Test Equipment) Indicator
*1.6 to 30 MHz Range
*3 to 150 Watts Input Power
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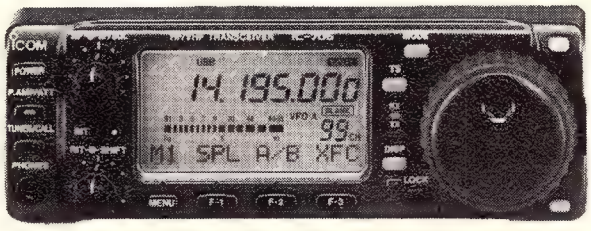
*For Marine, Aviation, Ham and Para-Military Applications

New IC-706 New

Icom technology has once again produced a history making first - the IC-706 HF/VHF all mode transceiver. This miniature marvel is the smallest of the class in the world. Covering all ham bands to VHF in all modes including RTTY. It features a detachable front panel for versatile mobile operation. Operating versatility for use as a base station, for mobile opereation or for portable operation!



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Regulation:	+/- 0.25V at nominal mains
Ripple:	less than 25 mV peak at 15A
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WE SHIP AUSTRALIA WIDE!

PG-4000 personal pager

Hot on the heels of its latest high-spec UHF CRS transceiver (the TX-4000), GME-Electrophone has introduced a personal pager named the **PG-4000**.

Before we go any further, this new gadget should not be confused with the network pagers operating through the main telecommunications networks like Telstra and others, as the PG-4000 suits a short-range local niche market concept ideally.

The PG-4000 is similar in appearance and operation to many existing pagers, but it is designed specifically to operate in conjunction with the TX-4000 UHF CB transceiver using the standard CCIR five-tone, 40 millisecond tone period SELCAL system. It is compatible with other brand radios using similar SELCAL features, but there are definite advantages to employing it as a GME system, since the new GME transceiver has a built-in pager facility we will discuss a little later. The PG-4000 comes with a pre-programmed 5-tone SELCAL number which can be altered by GME dealers using a PC and the appropriate GME propriety software. The pocket receiver's frequency is crystal-locked to UHF CB channel 23, and would require a new crystal fitted to change receive channels.

Not all dealers will be able to reprogram your pager, so it's worth phoning first before fronting with a pager to be reprogrammed. The module is powered by a small 9 volt, '913'-size transistor radio, black-stack battery which should run the pager for many hours at the measured current drain of about one milliamp (0.001 amps) in its sleep, or no signal present mode.

If a signal is being received on the channel, the pager draws about three times its sleep current and, having decoded its programmed SELCAL number, the beep or alert mode drains about 25 milliamps from the power source to operate the transducer. Naturally, the use of alkaline batteries will extend considerably the operating time over the cheapies. Owners might consider using a high capacity, rechargeable NiCd battery for best overall economy which should allow around 500 charges before its discharge cycle falls below a satisfactory level.

The pager also allows for operation from a secondary, external DC power source which can range between 5 and 15 volts DC.

The PG-4000 is a beeper alert type pager so don't expect to receive messages on an alpha-numeric display, however you won't get any pager bills either, because the system is totally independent of outside resources.

The pager's electronics are packed into a compact brown plastic case that looks for all the world like a 'normal' pocket pager. The unit weighs about ... grams (including battery) and belt clip, and measures 55mm wide by 20mm thick (without belt clip) and is 95mm tall.

Performance

Reception of pager signals is very reliable while the pager is kept within a few hundred metres of the transmitter source, and the reliable range is obviously improved if the paging source is a base station using a high-mounted external antenna.

Longer range reception is also improved by setting the PG-4000 high and away from cluttering objects — this means your body, too — so the signal path between transmitter and receiver is as clear as possible. This, of course, tends to defeat the purpose of a body-worn pager, but if you are stretching the range limit to maximum the results will be considerably enhanced using this technique.

The PG-4000 can be called directly from any SELCAL-equipped UHF CRS radio operating on channel 23, the nominated frequency. However, the GME-Electrophone TX-4000 has special built-in software that allows the transceiver to be used in a unique PAGer mode. Users expecting a call on any predetermined of their TX-4000 transceivers set the radio to the page mode, which, on detection and recognition of its unique SELCAL code, will automatically switch to channel 23 and transmit the predetermined SELCAL sequence to alert the pager.

As expected, the PG-4000's performance is a little unpredictable once the range from the transmitter exceeds a few hundred metres. For example, pager reception range is impaired when the unit is worn close to the body and is degraded further by its use inside buildings or motor vehicles and the like.

We conducted a number of tests to ascertain the range and SELCAL decode reliability of the PG-4000.

Excellent results were obtained up to 200 metres from a mobile-mounted transceiver using a fixed external antenna. Beyond this range the reliability was noticeably affected by the placement of the pager in relation to adjacent objects of considerable mass and to the user's body. Used like a lapel clip microphone it was far more reliable than being worn on the belt or stuffed in a pocket, even if it did look a bit silly...

We tested the pager in a major shopping center complex, having located the transmitter in a car parked just outside the farthest boundary of the shopping complex. The results were mixed. There were some quite dead areas within the shopping center, but for the main part, results were quite pleasing... but not 100 per cent reliable.

Outside the range of 500 metres the results were quite poor, although on the odd occasion we managed up to about one kilometre range from the car and a bit further using a base station transmitter with the antenna about four metres above the ground. Mind you, this was in a contrived situation.

Summary

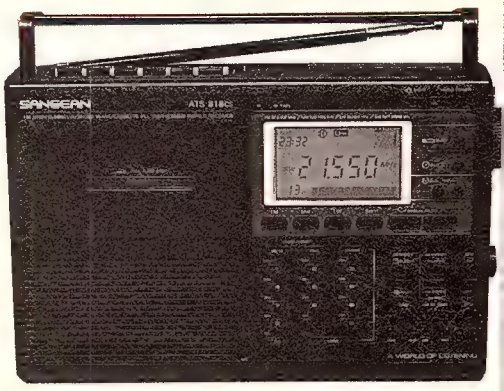
While the $160 PG-4000 is a handy little device, users should not expect it to operate reliably outside a range of about 200 metres from the transmitter. That's a bit disappointing, actually, after waiting so long for the unit to appear. The pager would be ideal for tradesmen and the like who are likely to be called from their base station while they are only a short distance from their vehicle.

Mind you, in many situations that sort of range would be ideal, and heaps of applications come to mind just so long as the pager does not get too far from its calling transmitter.

Radio and Communications thanks Powerband Communications for the loan of the review unit.

Everything You Need To

All-band World Receiver



This professional-quality receiver is very easy to operate with 45 station memories and a large digital display which shows: Frequency, time, signal and battery strength, lock status, alarm status and station memory number. The Sangean ATS-818CS gives you the advantage of being able to record your favourite shortwave or local AM/FM program, or simply play your favourite music tape. Requires 3 x 'AA' and 4 x 'D' size batteries or DC adaptor for mains operation.

Features:

- Covers AM/FM, Longwave (150 to 519kHz) and Shortwave (1.711 to 29.999MHz)
- Dual time display for local and UTC, plus full alarm clock functions
- AM wide/narrow IF filters for clearer reception
- Pushbutton selection of major SW bands from 120m to 11m
- Adjustable RF gain prevents overloading from very strong signals
- BFO (Beat Frequency Oscillator) control for receiving SSB & Morse Code signals
- Dual conversion design for improved receiver performance
- Cassette recorder with chrome tape facility & auto stop

Cat D-2842

SANGEAN $369

BONUS Portable Shortwave Receiver (D-2834) valued at $69.95

Portable Shortwave Antenna

Want to boost the performance of your portable shortwave radio? Then you need this wind-up reel-style antenna. It extends to a full 7 metres (23ft), yet fits in a shirt pocket! Connects via a 3.5mm mini plug or the supplied adaptor that clips onto your portable's telescopic antenna.

Cat D-4400

$19.95

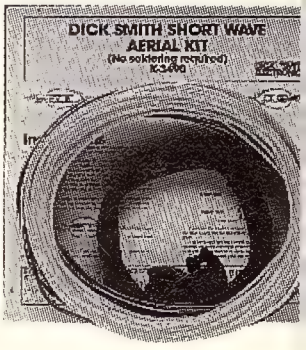
SANGEAN

Shortwave Antenna Kit

Get the very best from your equipment with this high-quality outdoor shortwave antenna kit. Comes ready-to-assemble with long wire antenna, lead-in, polyrope and "egg" insulators. It doesn't need soldering and comprehensive instructions are included.

Cat K-3490.

$38.50



Compact 45-Memory Shortwave Receiver

Makes finding your favourite shortwave (and local) stations as easy as pushing a button. Let it scan through the bands for you or, with the new Auto Tuning System (ATS), it will locate and put the nine strongest signals on both the AM and FM bands into memory. You can also key in a station's frequency direct from the keypad or put up to 45 frequencies into memory for instant push-button access. Requires 3 x AA batteries.

- Automatic Tuning System • 45 station memories • Comprehensive LCD screen
- Scan tuning & Direct keypad tuning • Dual alarm clocks • Dual time setting
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- Stereo earphones for FM stereo
- Antenna socket • Size: 148 x 89 x 30mm (W x H x D) FM: 87.50 - 108MHz

LW: 153 - 513kHz MW: 522 - 1710kHz SW: 1.715 - 29.995MHz*

*Includes 13 pre-set shortwave bands.

Cat D-2847

$249

BONUS Portable Antenna Cat. (D-4400) valued at $19.95

SANGEAN

et Into Shortwave Radio!

Base/Portable Scanner Antenna

Increase your scanner's coverage with this quality 1.4m antenna that covers the major scanner bands from 27MHz to 1300MHz. It's easy-to-mount with an inbuilt eye-hook, or it can be mast-mounted with optional clamps. Comes fitted with 3.5m of coax and a BNC plug allowing easy connection to most scanners.

Cat D-4432

MOBILE ONE COMMUNICATION SYSTEMS

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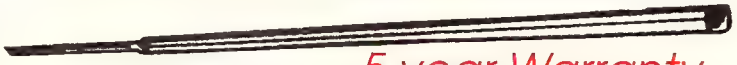
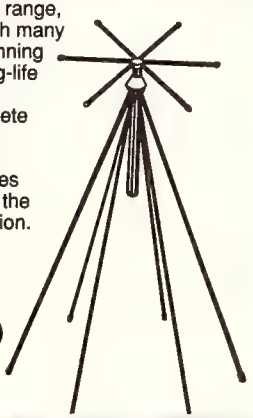


5 year Warranty

Scanner Discone Antenna



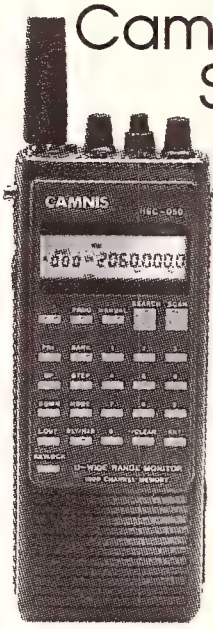
This quality Australian-made 12 element scanner discone antenna provides excellent receive performance across the entire 60 to 1000MHz range, making it ideal for use with many of today's wide-band scanning receivers. Made from long-life stainless-steel and brass materials, it comes complete with stainless-steel hose clamps for mounting the antenna to your mast. Uses an SO-239 in the base of the antenna for coax connection.

Cat D-4845

$99.95

BENELEC

Camnis HSC-050 Scanning Receiver



Provides incredible 100kHz to 2060MHz frequency coverage, with AM/SSB, N.FM and W.FM reception capabilities, and 1000 memory channels divided into 10 banks. A wide range of pre-programmed frequency steps are provided (1, 5, 10, 12.5, 20, 25, 50, 100kHz), or you can program you own between 1kHz and 999kHz (in 1kHz increments). Additionally, 10 programmable search banks together with highly flexible Bank-linked and Channel-linked Scanning provide enormous potential for locating active frequencies. Other features include a large back-lit LCD screen with bargraph signal strength meter, variable BFO for SSB tuning, an Attenuator to reduce strong signal overload, and battery-free memory back-up. Complete with NiCad batteries, AC charger, car lead, and earpiece.

Cat D-2795

Sensitivity -(nom. 12dB SINAD) - N.FM <1uV (5-1000MHz), <3uV (1000MHz -2000MHz) AM<1uV (1-1000MHZ)
Size: 78mm x 41mm x 184mm (W x H x D, including protrusions)

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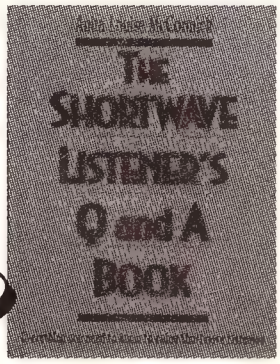

The Underground Frequency Guide

For exciting shortwave listening, you can't beat this directory of unusual, illegal and covert radio communications!

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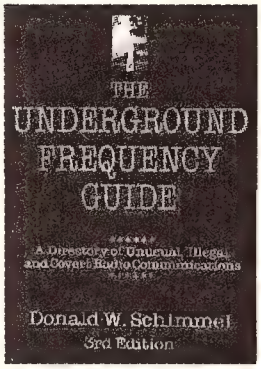
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DICK SMITH ELECTRONICS

MEGA CYCLES

The real story of the 11 metre amateur and CB band...

By Ken Reynolds, VK3TVS

"CQ, CQ, CQ eleven metres, this is VK3••• calling CQ eleven metres and listening for any calls..." came the plaintive cry of a lonely campaigner on 27.125MHz back in the mid 1970s. I used to listen to this guy around 4pm just about every afternoon. And, to the best of my knowledge, he was calling into the legendary void from which no answer is *ever* received.

Occasionally I thought of answering his plea for conversation, but we all know the destiny of a limited call who transgresses the holy Morse barrier (banishment to eternal disgrace) and with this fear in mind I just listened in quiet, perhaps similarly to some hundreds of already strongly established, but aloof and anonymous CBers.

The WIA — the Wireless Institute of Australia to those not in the know — had espoused that frequently-demonstrated occupancy of the 11 metre band by licensed amateur operators would be the saving grace. The authorities would see our well-earned right to the band and it would be preserved in the halls of Australian Hamdom for ever as a fitting legacy for future generations. In this way the threat from the dreaded scourge of the air-waves, CB radio, would be repelled from such hallowed ground and banished for ever and ever.

The truth of the matter is this: the 11 metre band is noisy with unreliable propagation, and it is shared with industry whose noisy RF welding and processing equipment emit enough brrring humdrum pollution to drive a girl crazy. And, who *really* wanted it for its amazing properties? No-one, of course. It was all just a matter of stodgy principles and the selfish rule of human nature that states... "I don't want it but I don't want anyone else to have it either." Am I right or am I right?

Unnoticed by most and ignored by others, a movement of monumental proportions was rapidly gathering strength and the necessary equipment from booming commerce to mount an unprecedented assault upon the holy grail of radio communications. And, before the authorities and amateurs had organised any real defence to fortify their ground, the tidal wave had broken and tens of thousands of eye-balling, illegal CB radio operators had stormed the legal barricades and 11 metres was theirs... taken by conquest and ruled by anarchy.

By 1977, the then ruling authority, the Department of Posts and Telegraphs (P&T to most) had grasped the fact that CB was not about to go away. Their crack commando force, namely one David Golds, was to all intents and purposes mega-loaded to the tune of 100,000 or more offenders. It was at about this time the department was struck by the realisation that it was losing the battle for law and order faster than it had ever expected or feared.

After considerable "Hmmm"ing and "Aggh"ing someone had a ripper brain wave, and it was agreed that it might be a good idea to legalise CB radio in Australia and — yep, you guessed it — we'll *charge* the little sods to use their radios.

However, Britannia must still rule in the colonies, so it was decided to allow *temporary*, licensed use of the 11 metre band by the rabble while their ultimate fate was decided.

Now, you don't really need 20/20 hindsight to know what was about to happen in the bureaucracy. Since there were already thousands upon *thousands* of perfectly good 23- and 40-channel CB transceivers in the country, P&T reckoned it would be a good time to change the rules.

With arrogant pomp and little ceremony it was announced that UHF CB would be progressively introduced, and it would have 40 channels at 477MHz which was an area of spectrum nobody had even heard of in those days. And, what's more, all operators would be licensed and would buy CB rig that wasn't even available yet. Good thinking, chaps...

And what's even furthermore, all your other rigs are illegal but, condescendingly, you can use them until we *really* screw up the band and get the manufacturers to build 18-channel 27MHz rigs that you'll hate.

We'll stuff you wankers yet. All quarter million of you can use 18 channels for a couple of years then you all get the chop again and get phased out. Now piss off and don't bother us until licence renewal time.

Hang about a minute, while we're still making the rules, you can't use beams and you can't transmit further than 50 new kilometres either. Hang on, make that 32 kilometres.

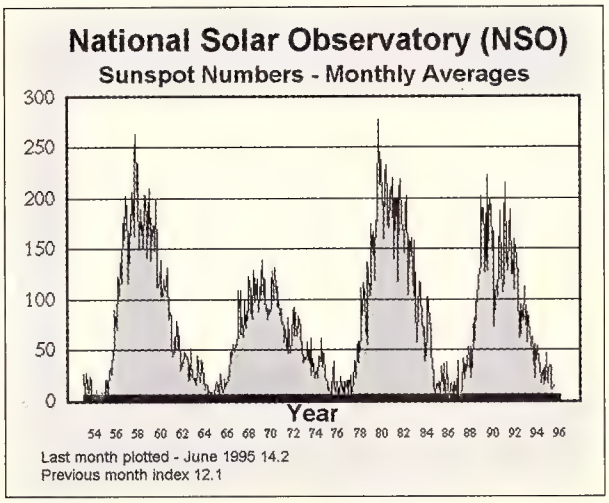
And, yes, we'll let you know when we change the rules again.

Understandably, the majority of users were pleased by the outcome of their campaign and, since they were now a legitimate part of society, their collective desire was to comply with the rules. In fact, CBers actively sought out the new 18-channel radios right until their 'phase-out' date arrived, when every CBer in Oz simultaneously went off air on 27 megs and moved to UHF CB on 477MHz.

Give us a break! Eventually, the rules were changed yet again and the new 18-channel, uniquely Australian allocation, was outlawed in favor of the original 40-channel band plan. The UHF CB allocation slowly, but finally got under way thanks to Philips-TMC, which put up a couple of million or so on a speculative venture that eventually saw it lose the market to just about everybody else, who put up nothing until UHF was well established and a sure thing.

CB radio was booming right across the country, but like most booms there would also be a bust, and the controlling influences were already actively doing their job.

Serious over-occupancy of the 11 metre CB allocation soon produced frustration and friction among the users who all naturally wanted to talk at one and the same time — and 10,000 CBers into 18 legal channels just don't



go. Try dividing the number of operators into the number of channels and you'll get some idea of the unworkable congestion.

Consider this for a moment: could the P&T and CBers possibly cause all this mayhem on their own? No, of course not! Mother Nature played her own important part in the scenario.

Around the time of CB legalisation the sun spots were emerging from their 11-year doldrums and really beginning to get pumping. The sunspot graph shows the story. Eleven metres was wide-open to the world. It was not unusual to hear all the states of Oz in the morning and have the American good buddies wall-to-wall in the afternoon.

The lure of long-haul CB communications was irresistible to the masses and, of course, this only served to compound the existing band problems with thousands upon thousands of new operators scrambling for supremacy over their peers. As an aside, the term 'boots' soon entered the CBers vocabulary, but that's another story...

CB Action was also booming with CB radio vendors fighting to get their new and newest rigs reviewed. In issue No 7 we actually reviewed *six* new AM-only rigs and two AM/SSB transceivers, being the legendary Viking 4740 18-channel and the Apollo MK-II on pages 102 to 105.

These were the days of *slider oil* and *submarine skip*, when the Uniden Washington Base and Grant were born, when Ringos and Dingos were names of antennas, and a Sawtron 792 was a deluxe 27MHz base station with SELCAL.

These were also the halcyon days which simply couldn't last. With little warning the industry moved into 'bust' mode, and within a few months most of the previously-lucrative CB dealerships had all but gone to the wall. One Melbourne company advertised the top GE model SSB transceiver for $80. It had been selling for about $300 just a few weeks earlier.

The industry was devastated, and suddenly the band was almost dead. There was still some skip but the operators had been beaten by constant frustration and a handful of cowards who inflicted their profanities on the masses from the safety of anonymity behind a radio signal.

During this quiet period we reluctantly reduced CB Action's content, page by painful page, from well over 130 pages an issue monthly at its peak to 48 pages quarterly, and finally closed down the magazine altogether due to a general lack of interest in CB.

The boom-bust cycle was complete.

There would never be another CB boom in Oz. The tens of thousands of CB transceivers laying dormant would constrain the future sales of the industry even if there were to be a resurgence of interest.

In the ensuing few years operators would occasionally arc up the old rig for curiosity's sake, but the magic had gone and quiet reigned across the land.

UHF to the rescue!

I think CB might have died altogether were it not for the gradual increase of interest in the new UHF band.

UHF was suffering badly from operator indifference until Philips managed to convince the authorities that the introduction of repeater stations was the way to go for a service that was largely short range-radio communications.

Australia's first legal UHF CB repeater burst upon the scene at Lysterfield, near Melbourne, operating on channels 1 and 39. The project had been kept so secret that the night the 1/39 repeater went to air, our friends from the Department spent hours in search of the perpetrators of such a blatant, dastardly deed!

"Oops. Sorry guys, we forgot to tell you about the authorised Philips experiment."

And so was born a new era of CB radio in Australia.

I am proud and pleased to note that the day P&T gave the go-ahead for the spread of UHF CB repeaters, a friend and yours truly, pulled the big switch at Channel 7 repeater in Frankston and the first permanently-sited and legal UHF CB repeater in the world was up and running. We had installed the equipment weeks before in readiness for the big day. Ho hum... 15 minutes of glory and all that.

Soon the previously rejected band was humming and there was a gradual migration from 27 megs to UHF. Many remaining operators were using both bands now, and repeaters were spreading right across the country and there was even a mini-boom in UHF.

The early '90s saw an increase in activity on 27MHz as the sunspot cycle climbed over the hundred mark, but by 1993 the index was falling back quickly and long-haul propagation was again becoming more the exception than the rule.

And what is happening these days?

Well, sad to say, not much. As I tune the band there are a few incorrigibles calling CQ DX on channel 16 and the usual run of bored nuisances looking to be noticed. On UHF repeaters there is that handful of reliable rebels involved serious 'get stuffed' sessions. Really depressing isn't it?

But wait a mo'. Take a look at the sunspot number for 1995. Could this be the end of another cycle?

Are we really at the bottom of the cycle again? It looks like we have gone about as low as we can go.

Just think, that means, maybe next year... maybe history *does* repeat itself sometimes.

A parting thought...

Isn't it strange? In the early 1970s nobody cared about CB radio. By the mid '70s nearly everybody cared about CB and the drive was to license CB operators and issue official callsigns for money.

In the mid 1990s, nobody cares about CB radio. You can't get the authorities to issue a CB licence under any circumstances — but if you tried they might just take your money anyway. Hmmm.

2 ele Delta loop	$217
4 ele 10-11	$225
5 ele 10-11	$274
6 ele log-yag array 12dbd 11M	$391
2 ele Delta loop	$208
11M 5/8 vert 4 radials	$158
Duoband 10-15 3 ele EA	$295
3 ele 15 M	$199
3 ele 20 M	$333
20 M Log-yagi 6 ele 11.5dbd	$755
2M 144.100 2.2 wavelength boom	$145
12 ele 2 M	$134
80 M VERT top loaded	$265
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M B Vert NO TRAPS 10-80	$265
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Tri-band beam no traps 5 ele	$690
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6 ele 6 M N.B.S. 50mm boom	$310
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GONE TROPO... By Christopher Davis, VK1DO

Although it is still some months until the annual VHF/UHF field day, I would like to inspire you toward the planning, preparation and rehearsal so vital to a successful field day.

Preparation of good kit enables activity, at short notice, separate and apart from specially-scheduled field day activities. Dedicating some antennas, feedline, power boards and the like in advance of the events makes good sense.

Just to repeat a general comment I have made both in this column and within articles on field days in general: Don't take any antenna, feedline, radio or combination of radio and amplifier, out into the field without doing a thorough 'dress rehearsal'.

There is a beautiful example given in the English textbook 'The VHF/UHF DX Handbook' within a discussion on cleanliness of signals. The example quotes the scenario when one operator's transmitter is teamed with someone else's amplifier with another chap's power supply and perhaps an unknown antenna tuner and antenna just to complete the hotchpotch.

Given that many variables, is it any wonder the end result is disappointing and usually something gets blown up? Why do seemingly tame components do strange things at the least desirable time, just when you could have been spared such dastardly cantankerous behavior? Perhaps Murphy's law... but more than likely there are some plausible scientific causes.

Firstly, your **12 volt supply**: a common choice of supply in the field is a car battery. Freshly charged, in excellent condition, the nominal voltage of such an accumulator is likely to remain close to 12 volts under load. Unfortunately, despite our reference to 12 volts, being the nominal voltage of a battery of six cells, most of our equipment *really* prefers 13.8 volts, being the nominal operating voltage of a car electrical system which has a strong alternator pouring the coulombs back into the accumulator.

A lot of our equipment contains voltage regulators providing internal rails at 10 volts etc. These regulators are not prepared for less than a minimal margin of regulation differential between input and reliably-regulated output. Operating from a battery that occasionally drops well below 12 volts, let alone the preferred 13.8, regulation to vital stages in the radio collapses. The consequences are usually disastrous to the transmitted signal's intelligibility and/or frequency stability.

Don't underestimate the value of having a *real* supply for your temperamental 13.8 volt transceiver and leave the battery for amplifiers which sound bad enough as the supply voltage sags under load. Remember also that a 13.8 volt regulated supply will not necessarily charge a battery at a high rate — rather, it effects a float charge.

Incidentally, if you don't believe how badly a battery sags under load, bear in mind that a car's starter motor is designed to keep the solenoid engaged as low down as 6-8 volts. Many early vehicles employed six volt ignition coils which operated with a ballast resistor which was by-passed in the ignition switch during cranking to ensure that the ignition system still functioned when the operating voltage fell.

Despite my contempt for car batteries, make no mistake they deserve careful handling. Exposed terminals on an 80 ampere/hour battery are just inviting a disaster. The latent energy

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in a battery can drive a two tonne motor car some distance on its own. Accidentally shorted, it will weld a metal wrist watch band into a lethal position in a semi-molten state, take a permanent liking to a large spanner and, if you are very unlucky, give a fatal demonstration of a small hydrogen bomb.

If you are removing a battery from a vehicle, remove the *negative* terminal first. In the event that the spanner bridges to chassis, there is no consequence.

Having removed the negative terminal's connection to the metal work of the car, you are less vulnerable with the positive terminal — but even so, try to use a spanner which is not long enough to fall between the battery's two terminals. (Oh, and if you are driving a Pommy car which still has a positive earth, you have my *deepest* sympathies.)

Building a **DC distribution board** with generous terminals and perhaps some heavy duty fusing in its connections to the battery or main supply, is time well spent. Each of these little projects takes time but they give years of service. Extension speakers, Morse key plugs and so on are all very difficult to cope with in the field, so preparing sensible combinations is time well spent.

Test any **amplifier** you intend to use with a power meter and ensure that the radio you are going to drive it with has sufficient (not excessive) power. Without dragging out a spectrum analyser, a simple test will suffice: Using carrier, increase the transmitter drive level while watching the amplifier's output power. Only increase the power to the point where a progressive linear increase is occurring. If going from five watts of drive to 10 saw the output power double but the next increase of drive saw only modest improvement in output power, then you are saturating the amplifier beyond 10 watts of drive.

Apart from the guaranteed wide signal which excessive drive produces, the quickest way to blow up an output transistor is excessive base-emitter voltage. Having determined the reasonable linear carrier output (and don't be mystified if it is well below its manufacturer's claims!) switch to SSB and aim to see the power meter on peaks reach perhaps as high as half the carrier value. The meter has such inertia that it starts to read the falling value before it has indicated the maximum. Attempting to adjust drive levels beyond this may indeed ensure more power — but probably not on the desired frequency of operation!

There is a regrettable school of thought that, for field day, you take your surplus antennas and feedlines. Unfortunately, 'surplus' in some cases means 'the gear that didn't work very well but hasn't been chucked out as yet'.

Check the *real* state of all your gear, preferably with a small-scale dress rehearsal. Take some notes of projects to be addressed and, by January, you will be confident and keen, secure in the knowledge that everything will work.

The successful field day stations don't just fluke it the first time. The exercise is challenging, the signals on a modest hill are impressive and the extension of your operating horizon is invaluable.

At present, there are two main field days. However, there are a lot of operators keen to see the organisation of activity weekends or QSO parties. This style of activity ought to attract those who abhor contests and would enable some concentration on difficult paths and bands and perhaps enable some operators to activate unpopulated grid squares and other worthy endeavors.

What do *you* think?

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HOT FREQUENCIES!!

Hospitals

It's a fact of life — people get sick. For most, a trip to their doctor is all that's needed to bring them back to health. However, for a small percentage, hospital is the only solution.

It doesn't matter if you live in a small country town or in inner suburban Perth, a hospital is usually close by. On closer examination, hospitals are just as busy in the not-so-apparent sections as they are in the most obvious casualty or emergency sections.

Imagine the support staff hospitals employ — cleaners, cooks, gardeners, security, administrative staff, drivers, plumbers, electricians — just about every trade or job designation you care to mention.

In most cases radio is used to co-ordinate the duties of those listed above. Security, for example, in a major hospital might have several city blocks and dozens of buildings to patrol and check. It would be difficult to find security personnel at the best of times in such a large complex, were it not for radio, which makes it that little bit easier. Obviously, help can be rendered far quicker with one radio call, rather than searching for a telephone, dialling a number and waiting for it to be answered — *if* somebody is nearby.

As government ambulance services perform fewer non-urgent patient transport runs, hospitals are forced to take on the job. Most now have several patient transport vehicles. The driver is dispatched to each assignment by radio.

Locating key staff within a hospital complex can be accomplished in several ways. Paging, public address or low-power in-house two-way radio systems are in use in most hospital sites. Paging is usually one-way, but it can be digital, alpha-numeric or even voice. Various frequencies are used for paging, and those normally found within hospitals are listed in the exhaustive table which follows. Low-power systems, depending on the size of the establishment, can be simplex or via a repeater. If a repeater is used, it will typically be of five watts output, which is generally just enough to cover the area.

Although very comprehensive, this list of hospital radio frequencies is not complete. It is, however, enough to whet your appetite, and you will be amazed at what you will hear occurring at your local medical center.

Frequency	Location or use
40.680	Hospital paging
40.750	Hospital paging
	Australian Capital Territory
412.875	Calvary Hospital, Bruce
485.400	Woden Valley Hospital
	New South Wales
70.460	Orange Base Hospital
70.460	St Vincents Hospital, Bathurst
70.670	Oberon District Hospital
70.850	Dubbo Base Hospital
72.470	Wyalong District Hospital
76.700	Parramatta Hospital, Westmead Centre Ambo ch 3
78.220	Sydney Adventist Hospital, Wahroonga
79.720	Blayney District Hospital
157.750	St John of God Hospital, Goulburn
157.840	Campbelltown Hospital
157.930	Gundagai District Hospital
158.260	Holbrook District Hospital
158.530	Hastings District Hospital, Port Macquarie
160.030	Bega District Hospital
163.120	Royal Ryde Rehabilitation Hospital
164.950	Corowa Hospital
167.080	Manilla District Hospital
168.4125	Manilla District Hospital
169.360	Moruya District Hospital
172.035	Lismore Base Hospital
172.050	Glen Innes District Hospital
172.095	St Vincents Hospital Lismore
172.825	Wolper Jewish Hospital, Woollahra
450.075	Lady Davidson Hospital, Turramurra
450.325	Calvary Hospital, Wagga Wagga
450.325	Cooma District Hospital paging
450.325	Cumberland Hospital Parramatta paging
450.325	Imlay District Nursing Home, Pambula paging
450.325	Kyogle Memorial Hospital paging
450.325	Moree District Hospital paging
450.325	Orange Base Hospital paging
450.325	Port Macquarie Private Hospital paging
450.325	Wellington District Hospital paging
450.325	Wentworth Hospital paging
450.375	Gosford District Hospital
463.425	Allandale Hospital, Cessnock
463.650	Royal Hospital for Women, Paddington
463.675	Sutherland Hospital
463.775	Liverpool Hospital
465.450	St George Hospital
467.100	Lithgow District Hospital
467.750	Tamworth Base Hospital
469.675	The Childrens Hospital, Camperdown
470.175	Hornsby Kuringai Hospital & Community Services
470.625	Coffs Harbour District Hospital
471.650	Auburn District Hospital
471.775	Rozelle Hospital
472.300	Campbelltown Hospital
472.300	Fairfield Hospital
472.300	Royal Ryde Rehabilitation Hospital
472.300	St Lukes Hospital, Potts Point
472.475	Morisset Hospital
473.200	Prince Henry / Prince of Wales Hospital
473.400	Cowra District Hospital
473.600	Wyalong District Hospital
474.625	Grenfell District Hospital
474.825	Mona Vale Hospital Community Health Service
474.650	Nepean District Hospital
474.825	Mount Druitt Hospital
474.825	Sydney Adventist Hospital, Wahroonga
474.975	Cumberland Hospital, Parramatta
475.000	Shellharbour Hospital
484.850	Manly Hospital & Community Health Service
485.775	Lidcombe Hospital
487.050	Repatriation General Hospital, Concord
487.175	Royal North Shore Hospital, Artarmon
488.900	Blacktown Hospital
488.950	Parramatta Hospital, Westmead Centre
489.000	Royal Prince Alfred Hospital
489.500	Parramatta Hospital, Westmead Centre
491.775	St Vincents Public Hospital, Darlinghurst
494.225	Dudley Private Hospital, Orange
494.925	John Hunter Hospital
	Victoria
75.680	Edenhope & District Memorial Hospital
77.630	Wodonga District Hospital
79.360	Alexandra District Hospital
79.360	Eildon & District Community Hospital
132.750	(AM) Alfred Hospital
151.275	Wimmera Base Hospital
157.720	Warrnambool Hospital
159.040	Ballarat Base Hospital
159.670	Mount Alexander Hospital
160.270	Maryborough & District Hospital
160.300	Wodonga District Hospital
161.230	Kaniva District Hospital
161.230	Yarrawonga District Hospital
162.370	Benalla & District Memorial Hospital
162.370	Swan Hill District Hospital
162.370	Tawonga District Hospital
164.290	Lakeside Hospital, Ballarat
164.530	Terang & District Community Hospital
164.680	Ballarat Base Hospital
164.680	Lakeside Hospital Ballarat
164.680	Ovens & Murray Hospital for the Aged, Beechworth
164.680	St John of God Hospital, Ballarat
164.680	Wangaratta District Base Hospital
165.370	Warracknabeal District Hospital
166.690	Ouyen & District Hospital
173.820	Portland & District Base Hospital
450.075	Royal Talbot General Rehabilitation Hospital
450.300	St Francis Xavier Cabrini Hospital
450.350	Royal Eye & Ear Hospital, Melbourne
450.475	Mercy Private Hospital, Melbourne
450.475	Numurkah & District War Memorial Hospital
461.550	Austin Hospital
461.550	Geelong Hospital
463.200	Preston & Northcote Community Hospital (PANCH)
463.675	Amalgamated Melbourne & Essendon Hospital
463.675	Macleod Repatriation Hospital
467.325	Alfred Group of Hospitals, Prahran
467.325	Goulburn Valley Base Hospital
469.650	Dandenong & District Hospital
474.450	Royal Childrens Hospital
474.625	Yea & District Memorial Hospital
474.900	John Fawkner Hospital, Coburg
485.075	St John of God Hospital, Brighton East
487.450	Mount Royal Hospital
491.475	Royal Womens Hospital Carlton
494.100	Amalgamated Melbourne & Essendon Hospital

494.100	Amalgamated Melbourne & Essendon Hospital
494.825	Fairfield Hospital
494.825	Mornington Peninsula Hospital
494.825	Wangaratta District Base Hospital
495.100	Bundoora Repatriation Hospital
495.100	Mornington Peninsula Hospital
508.225	Epworth Hospital, Melbourne
509.425	St Vincents Hospital Fitzroy
509.475	Nhill Hospital
509.550	Peter MacCallum Clinic/Hospital, Melbourne
509.575	Royal Womans Hospital, Carlton
509.925	Epworth Hospital, Richmond

Queensland

79.810	Mater Misercordiæ Public Hospital, Brisbane
79.810	Prince Charles Hospital, Chermside
79.810	QEII Jubilee Hospital, Coopers Plains
79.810	South Brisbane Hospitals Board, Woolloongabba
82.650	Goondiwindi Hospitals Board
82.815	Bowen Hospital
82.815	Collinsville Hospital
82.980	Mater Misercordiae Public Hospital, Brisbane
82.980	QEII Jubilee Hospital, Coopers Plains
82.980	South Brisbane Hospital
82.980	South Brisbane Hospitals Board
83.115	Mossman Hospital Board
129.600	(AM) Mater Misercordiae Public Hospital
156.725	Bamaga Hospital
156.725	Thursday Island Hospital
156.800	Bamaga Hospital
156.800	Thursday Island Hospital
450.050	Allamanda Private Hospital, Southport
450.250	St Andrews War Memorial Hospital
450.325	Xavier Hospital for Children
464.025	North Brisbane Hospital
464.050	South Brisbane Hospitals Board
465.875	Wolston Park Hospital
467.100	Prince Charles Hospital, Chermside
469.500	Calvary Hospital, Cairns
469.525	Cairns Hospital
469.975	North Brisbane Hospital
470.850	Townsville Hospital Board
471.250	Ipswich Hospitals Board
473.175	Mater Misercordiae Public Hospital, Brisbane
474.900	Gold Coast Hospitals Board
475.000	Townsville Hospital Board
486.825	The Wesley Hospital, Auchenflower
487.175	Baillie Henderson Hospital, Toowoomba
490.450	QEII Jubilee Hospital, Coopers Plains

South Australia

73.700	Loxton Hospital
78.100	Adelaide Childrens Hospital
78.100	Enfield Hospital
78.100	Flinders Medical Centre
78.100	Modbury Hospital
78.100	Queen Elizabeth Hospital
78.100	Queen Victoria Hospital
78.100	Repatriation Hospital
78.100	Royal Adelaide Hospital
80.580	Gumeracha District Soldiers Hospital
158.860	Riverton District Soldiers Memorial Hospital
159.730	Coober Pedy Hospital
166.090	Mount Gambier Hospital
166.330	Port Augusta Hospital
450.450	Repatriation Hospital
458.025	Oodnadatta Hospital & Health Service
462.625	Port Augusta Hospital
462.625	Whyalla Hospital
467.700	Royal Adelaide Hospital
469.700	Queen Elizabeth Hospital
469.725	Burnside War Memorial Hospital
471.325	Adelaide Childrens Hospital
471.875	Adelaide Childrens Hospital
474.925	Hampstead Hospital
474.925	Queen Victoria Hospital
484.850	Modbury Hospital
485.150	Glenside Hospital
485.900	Hillcrest Hospital
488.800	Glenside Hospital
489.300	Royal Adelaide Hospital
494.825	Adelaide Childrens Hospital

Western Australia

160.270	Homes of Peace Hospital, Morley
160.270	St Annes Hospital
168.280	Princess Margaret Hospital
171.660	Fremantle Hospital
450.400	Hollywood Repatriation Hospital
461.875	Hollywood Repatriation Hospital
462.900	Royal Perth Hospital
463.075	Sir Charles Gairdner Hospital
463.375	Sir Charles Gairdner Hospital
469.800	Royal Perth Hospital
469.800	Royal Perth Hospital
469.925	Royal Perth Hospital
469.950	St John of God Hospital
492.725	Geraldton Regional Hospital

Tasmania

77.330	Royal Derwent Hospital
77.705	Launceston General Hospital
77.840	N E S M Public Hospital, Scottsdale
77.840	St Marys District Hospital
78.220	Launceston General Hospital
78.220	St Johns Park Hospital
79.270	Mersey General Hospital
159.040	West Coast District Hospital, Queenstown
161.050	St Lukes Hospital, St Leonards
471.600	North Western Regional Hospital, Wynyard

Northern Territory

467.725	Royal Darwin Hospital
467.725	Alice Springs Hospital

If opportunity presents itself, check out the roof of your local hospital — chances are it is supporting a number of aerials. Here is a guide to determine which aerial is for which service: Paging antennae are usually ground plane independent, with one vertical element and three or four horizontal elements affixed to a center hub. The whips resemble a 27 MHz helical, however they should be slightly shorter.

For radio services in and around the hospital — such as security and domestic assistance — look for a co-linear or similar omni-directional aerial.

Coverage over a large area is not important, and can normally be obtained with a local transmitter.

This cuts down on the costs associated with setting up a repeater. Site fees, electricity and service costs are three of the largest.

Patient transport vehicles generally travel large distances, therefore propagation over most, if not all of the area is paramount. Repeaters associated with these departments are located on mountain tops away from the hospital. A low-power radio known as a 'trigger' is installed at the hospital. A Yagi or folded dipole antenna, aimed at the remote site, is generally hooked to the radio.

By keeping an eye out for any or all of these aerials, you will be able to ascertain what radio systems are used at your hospital.

(As an aside, you know the warning signs at the front door of so many hospitals these days saying YOU MUST NOT USE YOUR PORTABLE CELLULAR PHONE IN HERE BECAUSE IT STUFFS UP OUR DELICATE EQUIPMENT, MICROWAVES THE MEDICINES AND KNOCKS OFF OUR PAYING CUSTOMERS or words to that effect? Yeah, well, the analogue cellular phones run a maximum of 600mW output power, which ain't much, but another kind of antenna you see on the roof of these hospitals is for cellular phone *base* transmitters. That's right, most hospitals charge big rent to the phone companies to put their high-power multi-transmitter base units right on top of those paying customers! So whose RF is doing the damage?!!)

GRN update

Recently the NSW Minister for Police has repeated his election promise regarding the NSW GRN and the Police Service. Basically he has stated that Police will not be "...forced onto an inadequate GRN...". He went on to say that "...a move to GRN will only occur when all parties are convinced that it will provide a better radio service...". If the NSW Bushfire Brigades experience is any indication, that will be never.

To further reduce the chances of GRN becoming a statewide system, the Minister indicated that a thorough investigation of the tendering process for the GRN will be conducted.

In the meantime, GRN is planning the installation of three additional bases, two in the Sydney area, one on the South Coast. It is believed that the costs associated with the establishment of each base site is in vicinity of $200,000. And this system was supposed to save money?!!

That's your lot for this month. Do you have any ideas on topics for **Hot Frequencies**? If so, drop me a line at the address given below. I welcome mail from readers highlighting frequency use in their area. However, due to the quantity of mail received, I am not in a position to answer mail personally. Sorry. See you next time.
Russell Bryant, PO Box 344, Springwood, NSW 2777

11m DXinternational

By Jack Haden

It always happens soon after a deadline passes and all the work for this column has gone to our editor's desk in Melbourne... the bloody band opens up! The weekend of July 1 and 2 was a lively one on 11 metres for the DX community, but not only on 11 metres.

The normally dormant VHF amateur radio frequencies came alive too as the MUF (Maximum Useable Frequency) reached six metres (50MHz) and above. South Australian and Victorian amateurs were working numerous interstate stations along with the odd contact or two into New Zealand. Some Queensland amateurs also worked into Papua New Guinea too, I was told.

I chatted for around 20 minutes on six metres to a VK3 mate near Melbourne for around 20 minutes with good signals and minimal fading — not too bad for a winter's Sunday in July, eh? There were plenty of clear frequencies to start with, but as word got around that six metres was open the side channels near 50.110 MHz started to fill quickly with chatter.

Meanwhile, down on 11 metres, things were becoming quite nasty, especially on channel 35 as people jockeyed for space to put a call out for mates interstate and around the Pacific. Likewise, channel 16 wasn't much better either as it was slightly overloaded too with DX activity. The New Zealand call channels were in a chaotic mess as many Australian DXers converged on those too.

As it neared sunset there were signs of Africa and the Middle East on 11 metres and the serious DXers who roost well above channel 40 were in hot pursuit of it no matter how poor the signals were. To the relief of many, some European signals made it through to Sydney that weekend giving a ray of hope to many dampened spirits that all was far from lost DX wise on 27MHz.

Slim No. 1 exposed...

The **MacDonald Islands**, a lonely outpost near Heard Island, has been doing the rounds off and on for the past four or so years by way of Ken, the UNIT-22 aka 229-TR-01. I have always had my doubts about Ken, so when he was last active from the MacDonald Islands in July I decided to do some investigating.

A telephone call to the Australian Antarctic Division in Kingston, Tasmania confirmed my suspicions after a word with the man in charge of the MacDonald and Heard Islands. There is no-one on either of the two island groups, and there hasn't been for some time. Both islands are 'frozen' in due to the severe Antarctic winter, and there is no human life on either. So there you are: Ken is not there, hasn't ever been there, and never *will* be there!

Tweed Radio should also take more care in giving out callsigns without checking the operator's documentation beforehand...

With Ken's cover finally blown and my mind finally at rest, this brings me to the reported activity from Heard Island in recent months, also reported by AAD to have no human life on it in recent times. So I wonder about the 229-AG-102 operation from Heard Island, operated by Bill, that was doing the rounds a few months or so back?

Slim No. 2 exposed...

Banaba Island was reported active in late July as 320-AT-101 or 320-AG-01 operated by Paul using both callsigns. Strange that no Pacific or Asian DX was about when I heard Paul at 03302, only big interstate signals. A quick call to two mates, one in 224 prefix and 271 prefix, via the telephone, to come on air soon proved my suspicions. There was no propagation at all to either country, so how come *you* were five by eight in Sydney, Paul? Try far North Queensland rather than Banaba!

Other rumored slims on 11 metres

You may be waiting for a card or two from the following stations, all suspected of being hoaxes or slims: 65-AT-104, 310-AC-737, 171-AW-02, 211-AW-02, and a number of Alfa Tango members in 169 prefix have reported that their callsigns have been 'borrowed' by stations unknown!

DXpedition news, rumors and other gossip...

Looking at activities on a world-wide basis, there appears to be a lot going on, but whether or not we get to be a part of the action remains to be seen. DXpedition activity to some of the more needed DX spots in the world are becoming less frequent as poor band conditions deter would-be activation teams.

Madagascar in the Indian Ocean will be placed on air commencing September as 188-RC/O and remain active until 500 contacts are recorded into the logs. Quite a few here in Australia need this come confirmed, as Madagascar's poor QSL return record is legendary. For this planned operation QSL via PO Box 2032, Bourges 18026, France. Return postage funds essential.

Hungary will be activated from September 25 to 30 as I09-AT-MULTI, however I am not really sure what the special event is all about. QSL via 1-AT-184 in Italy with SAE and return postage.

The **Slovak Republic** should be still active by way of two visiting Polish operators signing as 161-AT-230/330 and 161-AT-345/330. Should you secure a contact and need a QSL, the route is via PO Box 8, Lesko 38600, Poland. Return postage funds required when QSLing.

Jersey Island, a part of Great Britain, is scheduled to appear as 167-MB/O during September although exact dates are not yet clear. The QSL route for this one is via PO Box 21, Chocques 62920, France. Return postage required.

Guernsey Island, also a part of Great Britain, should be activated during September as 169-MB/O. Again, as with the Jersey operation, exact dates are not known. The QSL route and requirements are the same as the information given for the Jersey Island operation.

A special event station celebrating **Mexican** independence will be operating during the month of September with a callsign of IO-AT/IM. The QSL route has been given as PO Box 21, Ixtapaluca 56530, Mexico. Return postage appreciated.

Another special event station, this time celebrating **Brazilian** independence, will also be active throughout September signing as 3-AT/IND. QSL for this one via PO Box 57, Guanja 11401-970, Brazil. Return postage and SAE appreciated.

Martinique Island in the Caribbean will be activated during September as

136-ED/O and remain on air until 3000 contacts are entered into the station logs. With conditions as they are, the station should be on air for a while I expect! The QSL route for the lucky is PO Box 19, Corbie 80800 France. Return postage and SAE required.

ITU Geneva is one not to forget as a planned operation is scheduled to commence this coming October and will sign as 235-AT/DX. Mark it on your calendar now if you still need this one confirmed. Actual dates and QSL route are yet to be announced.

Pakistan may be put on air during October as 114/999-PIG-000 — and what a mouth full *that* will be! The actual date of commencement is not known here, but the QSL route is via PO Box 26, Fawkner, Victoria 3060. Return postage and SAE are a must.

Benin in Africa is another planned activation, and it is hoped the operation will sign as 183/999-PIG-000 sometime in October, but the actual dates are not yet known.

QSL via the same address given for the Pakistan operation — and again, return postage is a must.

Andorra will possibly appear on the band as 51 RC/O commencing in August and remaining on air until 500 contacts have been made into the station log. QSL via PO Box 2032, Bourges 18026, France. Return postage funds a must.

Sardinia will be activated in an IOTA capacity with activity from Mal di Ventre Island as 165-AT/OR01, Sa Mesalonga Island as 165-AT/OR05 and Isolotto Peloso Island as 165-AT/OR04 respectively in the period August 26 to September 1. QSL via PO Box 4, Succ-2, Modena 41100, Italy. Return postage required for QSLing costs.

Don't forget the scheduled IOTA operation from **Thassos Island** scheduled to appear on 11 metres as 18-AT/TAS in the period August 28 through September 10. QSL via PO Box 102402, Dusseldorf 40015, Germany. Return postage and SAE required.

Latin America and the Caribbean

Some sporadic signals have been noted from this region, although they haven't been too good in the signal strength department. Hopefully, as we leave winter behind, the path to Latin America should come alive with some stable DX paths and workable signals.

Panama, Costa Rica, El Salvador, Cuatemala, Belize, Honduras and Nicaragua have all been heard in recent weeks, although signals are often unworkable or subject to heavy fading. So there *is* DX out there, and let's all hope that things will pick up as we emerge from our winter.

North American DX has been appearing on 11 metres at a variety of times during the hours of daylight and, although signals haven't been all that good, some of it has been workable. As usual, the odd station from Mexico can be heard from time to time so all is not yet lost!

Arabia and the Gulf States

Not a great deal of activity to report from the Arab world, although the odd weak signal from tliz United Arab Emirates, Kuwait and Saudi Arabia have been heard, but often far too weak to be of any use here.

Perhaps if I was resident in Darwin rather than Sydney I might be in with a better chance!

Kuwait was logged at 0705z by way of 102-AT-?? riding through the noise — the signal was that poor it wasn't worth the effort in chasing up a contact as the conditions were so hopeless.

Saudi Arabia just made it through the noise at 0717z with someone calling out simply as '48 division' and, as with the Kuwaiti station, the signal was very weak and thus not worth the bother. Hey, why not be choosey?!

Yemen may have been active around 0644z in late July as I heard a number of Asian stations calling frantically for the 323 prefix although I heard nothing from the station in question here at the time.

Africa & Indian Ocean news

Some of the islands in the Indian Ocean have been heard here on the east coast from mid-afternoon onwards; again, signals have been virtually useless, although I've been informed some sandgropers over in the west have made the odd good contact or two...

In case you are wondering about what happened to German traveller, and DXer, Thorsten, the 13-AT- 455 and his Pacific DXpeditons... well, last I heard he was back in Germany after doing a stint of fruit-picking in Queensland to put more funds in his exhausted coffers. Being a budget traveller, he soon found things far from easy in the sleepy south seas.

Thorsten, like many others who come to the Pacific, quickly found that air fares in the region are not as cheap as they were a few years back, and cheap island accommodation too has mostly disappeared in favor of more up-market abodes.

Food costs have also increased rapidly in Pacific nations as transport costs add to the value of the imported foods that westerners like.

Also, the poor propagation conditions have done little to boost his 'appetite' for continuing the DXpedition, as he could not have picked a worse time in my book to be bundling about the Pacific.

At least he enjoyed himself and made many friends on his travels, at least judging by his report published in AT's Australian *11 NEWS* a few weeks back.

China has been noted on 11 metres from time to time with two stations being mentioned, although some people have expressed doubts about one of the two. In late July I logged a station simply calling 'CQDX from 203 division' with the operator being a Mr Cheung or Chang who also signs as the UNIT-402. Other details remain a little conflicting, depending on who you speak to. At 06102 Cheung was a fair four by one report.

The other station, which is under suspicion because of the operator's Australian accent and reluctance to fiunish a QSL address in China, is the UNIT-186 operated by John. Work first and worry later I would strongly suggest. As for Cheung, he gave out an amateur radio club station address in China for his QSL routing.

Rotuma DXer, Peter the Whiskey-6, acquired a new callsign in early July and now can sign as 325-TR-01 if he wishes. Some people are complaining about not getting a QSL back, one DXer saying he sent three sets of cards before he received a reply from Peter. I wonder if return postage was sent in each instance? Remember, if you send no return postage to the DX station then don't complain if you get nothing in return!

Western Kiribati, **Vanuatu**, **Marshall Islands**, **Guam**, **Hawaii**, **Mariana Islands** plus the usual south-east Asian stations, can be heard when the band makes an effort to open, again, usually in the hours of daylight.

As there is little else of value to add I will sign now and say 73. News and views may be sent direct to PO Box 299, Ryde, NSW 2112, and for a personal reply a stamped self-addressed envelope must be included. 73 de Jack.

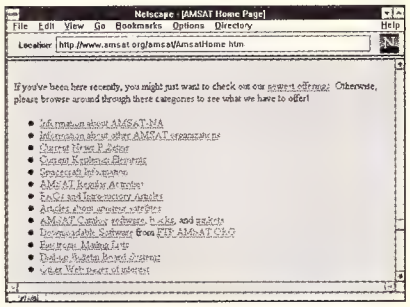
Jack Haden checks out the DX on 27MHz...

Welcome again to *Here and There in Amateur Radio*, the column in Radio and Communications which keeps an eye on what's going on amateur radio. The sky's the limit here — no amateur radio stone is unturned in the search for something new. And remember, *Here and There* is waiting for you to write, fax, e-mail or drop in to tell us what is happening in *your* particular bit of amateur radio.

For a really serious search for something new, what better medium could there be but the Internet? Now, there is a lot of rubbish being spouted about the Information Superhighway or Infobahn in many of the newspapers and magazines. But without doubt, there is an absolute feast of information just waiting for you to find on the Internet. This month, *Here and There* has a few Internet leads which you might like to follow.

But take care — a quick review of amateur radio resources on the Internet cannot be exhaustive, since the ground is shifting every day. Some of the sites mentioned here may have disappeared by the time you look for them (although most do seem stable). Also, while the easiest way to search the Internet is through the World Wide Web (WWW), it is impossible to follow *every* hyper-link that appears. Our best advice is to choose one of the sites mentioned below and follow your nose...

Finding your way


Netscape - [AMSAT Home Page]
File Edit View Go Bookmarks Options Directory Help
Location: http://www.amsat.org/amsat/AmsatHome.htm
If you've been here recently, you might just want to check out our newest offerings. Otherwise, please browse around through these categories to see what we have to offer!
Information about AMSAT-NA
Information about other AMSAT organizations
Current News Bulletins
Current Keplerian Elements
Spacecraft Information
AMSAT Regular Articles
FAQs and Frequency Guides
Articles from amateur satellite
AMSAT Online software, books, and patches
Downloadable Software from FTP.AMSAT.ORG
Packet Mailing Lists
Online Bulletin Board Systems
Other Web pages of interest

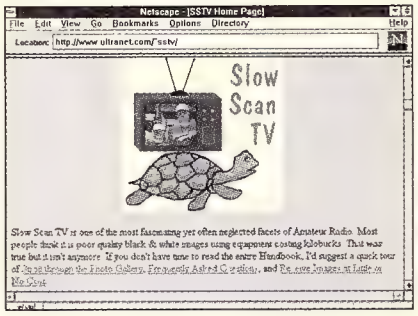
If you do not know where to start on the Internet, there are some clever pieces of software called SEARCH ENGINES which will take a key word or two and return a comprehensive list of relevant sites. But an educated guess is often enough; in this case, it seemed reasonable that the amateur satellite organisation, AMSAT, might have a WWW page at www.amsat.org. And lo and behold, that's exactly where it is to be found!

This home page (or starting point) in the World Wide Web actually resides on a corporate computer belonging to Qualcomm, a commercial manufacturing company which accepts as guests non-commercial organisations such as AMSAT. So an alternative address is www.qualcomm.com/amsat/amsat.home.html. The simpler address www.amsat.org is known as an ALIAS.

When *Here and There* visited the AMSAT page, it was offering information about the 1995 AMSAT Annual Meeting and Space Symposium; clicking on the highlighted link here sends you off to a new page with more details. As well, there was a link to a feature article on digital communications on Phase 3D, the next generation of amateur satellites which will probably end up in geostationary orbit. The titles of previous feature articles were listed, so it is probably worth visiting this page every now and then to see the topic of the latest feature.

This page, like many others, then lists other WWW sites to visit which have an amateur radio flavor. At this point, things can get quite interesting, since it is highly likely that *these* pages will also have their own list of suggested links. What you need now is plenty of time, therefore, and some

The American Radio Relay League, Inc.


Netscape - [SSTV Home Page]
File Edit View Go Bookmarks Options Directory Help
Location: http://www.ultranet.com/~sstv/
Slow Scan TV
Slow Scan TV is one of the most fascinating yet often neglected facets of Amateur Radio. Most people think it is poor quality black & white images using expensive costing kilobucks. This was true but it isn't anymore. If you don't have time to read the entire Handbook, I'd suggest a quick tour of Scot through the Photo Gallery, Frequently Asked Q's etcher, and Pic-size Images to Table in No Time.

idea of what you are looking for. It is very tempting to follow link after link, then realising after an hour or two that not much of substance has turned up! Beware — your on-line costs may be mounting up...

Here is a taste of what was on offer during our visit:

• A satellite ground station at gndstn.sp.nps.navy.mil monitors three amateur satellites (AMSATs). *Here and There*'s attempts to follow this link failed, but the site may have been busy or not available. Have a go, there is bound to be something of interest there.

• Manfred Bester, W6/DL5KR, offers various satellite tracking details. He is the author of SatTrack, one of the better satellite tracking computer programs available.

• Details are available of the latest SAREX mission. SAREX stands for Shuttle Amateur Radio EXperiments and refers to the regular amateur radio activities taking place on Shuttle missions. There seems to be a licensed amateur on every mission now and the experiments get more interesting every time.

So far, *Here and There*'s Internet search was concentrated on amateur satellite information, since AMSAT was the starting point. But as is so often the case with the Internet, one topic leads to another.

Links were available to the Amateur Radio Relay League (ARRL), the national amateur radio organisation in America (www.acs.oakland.edu/barc/arrl.html) and to a page offering a listing of other amateur radio WWW sites (www.acs.ncsu.edu/HamRadio/OtherWebs).

This particular list leads to a veritable cornucopia of sites, so prepare for a long night searching them all!

See the breakout box for a sample — but remember, they may not all be available when you do your own searching.

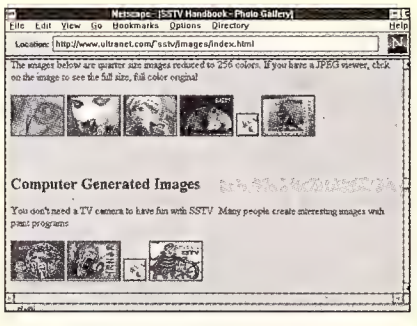
Serendipity on the Internet

Whether you search the Internet the 'correct' way using search engines or use a bit of guesswork and try AMSAT, for example, you can be sure that even more leads will appear when you are least expecting them.

Recently, a list of sites was published in the computer pages of a newspaper which offer stereograms, the 3D pictures you have to go cross-eyed to see, and shareware computer programs to generate your own (for a local example, try cvs.anu.edu.au/andy/rid/riddle.html). Amongst all this was lurking the site metro.turnpike.net/V/VE3sun, which turned out to be an amateur radio-related page managed by VE3SUN. So add that to your list of sites to try.

Packet radio and the Internet

There is no doubt that the Internet has transformed amateur packet radio. Logging on to just about any radio bulletin board now provides pages and pages of messages on just about any aspect of amateur radio imaginable (see *Here and There* in the first R&C). These messages were for a long time being forwarded by HF packet, a relatively slow process. But the arrival of 'wormholes'


Netscape - [SSTV Handbook - Photo Gallery]
File Edit View Go Bookmarks Options Directory Help
Location: http://www.ultranet.com/~sstv/images/index.html
Computer Generated Images
You don't need a TV camera to have fun with SSTV. Many people create interesting images with paint programs

has changed all that and now the messages arrive by the hundreds every day.

A 'wormhole' is an Internet link which carries information from one part of the amateur radio packet network to another, completely invisibly as far as the average user is concerned. Various bits of legislation in Australia and elsewhere prohibit direct communication between amateur packet and the Internet. But our amateur packets travel incognito (and quite legally, of course) by being embedded in Internet packets as they leave the amateur network. They are then scooped out at the other end to be returned to the amateur domain.

This free flow of messages means that it is very difficult to keep up with all of them. Looking today, for example, at VK3BLW, which is VK3DBP's local radio bulletin board, there are currently 1883 active messages, of which about 20 have arrived since last logging on.

But that is in the space of an hour or two. Since yesterday, about 150 new messages have appeared from all over the world. Over a week, hundreds and hundreds of messages arrive. If you list all their titles, it gets very tedious; if you don't, you end up missing the interesting ones!

Join the Conference

But that's not all. Many radio bulletin boards carry a Conference link, not dissimilar to the International Relay Chat or IRC offered to Internet users. Joining a Conference provides you immediately with pithy but often interesting messages from amateurs all over the world. You can talk to anyone, whether they are in Birmingham or Brazil, just by typing at the keyboard.

If you want to move away from the busy main channel, you can move to another channel using the /C command followed by a channel number. Alternatively, use /I (for Invite) command to invite another station to join you on an unused private channel and have a normal amateur radio conversation. And if you want to know who is about, the /W for Who) command will list all users.

Be warned — quite a lot of Conference chat is about trivia (What's the weather there? What time is it in Rio de Janeiro? and the like.) But used intelligently, it can provide a very useable channel to just about anywhere in the world.

On the Nodes

Another addition to packet radio, again available through many bulletin boards, is a network of nodes, each of which is accessible through a CONNECT command from the bulletin board's main command list. Certainly in Melbourne and presumably elsewhere, there are also packet repeater nodes, such as VK3RPS, the role of which is to provide access to other nodes.

How packets get from one place to another is completely invisible to the average user but you can be sure that the Internet is going to be in there somewhere. Connecting to a node can give the average AX-25 packet user access to bulletin boards, satellite gateways and all sorts of exotica in a wide range of countries, without any knowledge of TCP/IP or other fancy stuff that we are reliably informed *some* people understand (but not us).

There is even a way through to the real Internet, our spies tell us. But the potential legal implications surrounding the free flow of amateur radio-Internet traffic are too hot to handle until governments around the world get together and sort it out.

It is estimated that there are six million pages of information on the World Wide Web and new ones are appearing at the rate of 100,000 a week. This does not mean that new information is being generated, of course, but there might be a few things out there that even R&C has not caught up with yet.

So go to it — surf the Internet if you must but make sure you look in on the amateur radio sites. And if you uncover something interesting that we have not listed here, let us know.

Cheers and 73 from Paul, VK3DBP.

Amateur Radio-related World Wide Web pages on the Internet

Compiled by Ron Klimas and Paul Butler

ADRS Amateur Digital Radio WWW site:
http://www.iea.com/~adrs
Amateur Radio Operator-On-Line Magazine (EVE Graphic Services):
http://www.amateurradio.com
AMSAT-NA Radio Amateur Satellite Corporation:
http://www.amsat.org/amsat/
AmSoft Web Page for The World Of Ham Radio CD-ROM:
http://hamster.business.ca/~amsoft
ARRL — the latest bulletins, news, and files from HQ:
http://www.acs.oakland.edu/barc/arrl.html
Best of 75 Net:
http://www.mindspring.com/~ko4ta/bestofnet.html
Boston ARC Web page: New England happenings and more:
http://www.acs.oakland.edu/barc.html
Brown Radio Club (Providence, RI) Web Server (K1AD):
http://archive.phish.net/BRC
Callsign server with the latest QRZ CD-ROM, from the source at QRZ:
http://www.qrz.com/callbook.html
(You can also input your e-mail address directly into the QRZ Callsign Database, where it will be published on both CD-ROM and on the Internet: http://www.qrz.com/email.html)
The QRZ Anonymous FTP Server:
ftp.qrz.com
Callsign server derived from the FCC online database via the University of Arkansas at Little Rock:
http://www.ualr.edu/doc/hamualr/callsign.html
Callsign data for all 1x2 and 2x1 calls, all US call areas:
http://www.raddev.com/biz/raddev/
Callbooks including QRZ, US, UK servers:
http://www.cc.columbia.edu/~fuat/cuarc/callsign-servers.html
California Amateur VHF Enthusiasts Group:
http://www.ccnet.com/~rwilkins/
Canadian Amateur Radio / VE2RM ARC:
http://www.cam.org/~dino/ham.html
Columbia University Amateur Radio Club (W2AEE):
http://www.cc.columbia.edu/~fuat/cuarc/
CINET Jersey Ham Radio Pages (GJ4ICD):
http://user.itl.net/~equinox
(Lots of HF-VHF-UHF amateur radio information and links to other sites. DXCluster link, VHF-UHF newsletters, beacon lists, solar data and more.)
Clear Lake (Texas) ARC CLARC Homepage:
http://www.phoenix.net/USERS/biekert/index.html
CQWW related WWW page by OH2KI:
http://mpoli.fi/~leif/oh2ki.html
(Contest and DX related.)
Daytona Beach Amateur Radio Association homepage:
http://www.america.com/~drayegon/dbara.html
(QRZ online call sign directory and more.)
DSP — Mike Cook's home page, below-the-noise EME software & info:
http://www.webcom.com/~af9y/
DX news and calendar via IK4LZH Web page:
http://promet12.cineca.it/htdx/index.html
EI5DI Home Page:
http://www.iol.ie/~okanep/

Continued on Page 77

DX & BAND REPORT

Well, the band conditions may continue to cause the DXers heart-ache, but there is no shortage of ingredients to make a super DX cake big enough to keep us all happy. Certainly there have been a bit of 'win some' and 'lose' some ingredients to the DX scene. As I write this, **Libya**, that very rare DXCC country, is active and being heard daily on both CW and SSB. It seems an age since Bert was signing **5AØA** and available on the bands for many months. Since those days for many DXers a chance at Libya has been a large zero.

The group led by Toly, **UT3UY** is from Ukraine, and accompanies a diplomatic entourage from Ukraine to establish full relations with Libya. It was with this background that permission was sought for authorisation to operate amateur radio. Finally it seemed that, on arrival in Libya, authority would be given to the amateur radio group accompanying the party.

So in due course **5A1A** hit the bands and, from my point of view, initially they did this very quietly! I often heard the pile-ups, but in the early days 5A1A was just a whisper here. However, signals have improved — or maybe band conditions are better. In any case, as the QSO totals increased, other bands were being worked, and 40 metres seems the place to be.

It is great to hear Libya active and congratulations to the Ukrainian group and of course the Libyan authorities for this effort.

North Korea, P5

...Then there was the short operation from North Korea mentioned last issue. Did I work them? Well, the answer is a loud NO!! However since only a handful of QSOs were made it is admitted that I do not feel too hardly done by. What this demonstration operation achieved was to bring North Korea into the world of amateur radio for the first time ever.

The documentation for the operation was accepted by ARRL DXCC and, in the true traditions of DXing, a new country was added to the list. For a fleeting moment in time a few DXers have the beating of us — they have worked North Korea so they are one up.

But, if things go according to plan, we will have a return to North Korea, a longer operation and probably one of those horrendous everlasting pile-ups as *everyone* will need it. It may just be that a QSO with P5, North Korea may be relatively easier for us. Relative, that is, to many other areas of the world. We shall see.

The word is that the operation will take place before mid-October so be on the alert. I'll pass any information I receive via the 14,222 kHz net or on the 14,260 kHz IOTA frequency.

Scarborough Reef, BS

...Then there was Scarborough Reef and the recent second operation signing **BS7H** from this tiny area of real estate. I received the awaited fax from DXCC with the result of the expected DXAC vote on Scarborough. DXAC voted nine to seven *against* the addition of Scarborough Reef to the DXCC Countries List.

The dust has not had time to settle. Martti Laine, **OH2BH** has written a four-page open letter on the subject to DX outlets. In some ways it does not make pretty reading, and one can feel the frustration that the vote has not gone the way expected.

Be that as it may, DXAC has voted and, according to the DXAC chair, the minimum size ruling was not applied to this petition and each member voting "...made a judgement in accordance with the DX communities they represent...". Taking everything into account maybe this is not how DXAC should vote. If rules are in place should not a decision be based on those rules? (Does the application meet this criterion and that point? All that stuff.

Ah well, don't know about you but I am glad we are not involved.

Heard Island, VKØ

The surprise release on Heard Island had me on the wrong foot for a while as the release was for a DXpedition this year and I was *sure* it was wrong. All previous plans seemed to be for 1996/97.

Not so! As I understand things there has been a split in the group and now Heard will be activated (Allah willing) about November 12.

The team leave Fremantle on November 1 for that stomach-wrenching 11-12 day sea trip to Heard. Approval has been issued, a boat chartered, and now the real preparatory work in beginning. Activity is envisaged on all bands and modes, and all elements of the DXpedition are now in place. Team leader is **KØIR**, and KK6EK, ON6TT, HB9ATL, N6EK, PARDUU, K5VT, DJ9ZB and JH4RHF are all mentioned as members of the group.

Propagation will be a major factor and, in my opinion, this will be a quite different situation to that of the Peter 1, South Sandwich and South Georgia DXpeditions, for example. There is no north-south path of wall-to-wall US stations to keep QSL totals going.

The Honorary Expedition Leader is Sir Edmund Hillary. Assistance is requested via:

KØIR Heard Island DXpedition
PO Box 563,
Waite Park,
MN 56387-0563
USA

The Australian co-ordinator is VK2BEX, the Japanese co-ordinator JH1AJT, and we'll have more details as things progress.

Libya, 5A

As mentioned the operation from Libya is, as I write this column, a reality. The operators mentioned are Anatoly **UT3UY**, Peter **UT2UA**, **UT3DX** and **UX4UM** and all are experienced.

In simple propagation terms, Libya is not a difficult location, and the signals from the group have generally been very good. For example, on 80 metres SSB I had them a solid strength 5-7, and on 40 metres the 5A signals on both CW and SSB have been good. This morning at my sunrise I worked the 5A1A on 80 metres SSB.

On two or three occasions they specifically looked for VK/ZL stations after I alerted the operator.

QSL Route: LZ2UU

Tunisia, 3V

It is reported that Selim, **OE6EEG** and others were in Tunisia for two weeks in early August. They planned to operate signing **3V8SR**. I have no QSL information at this moment. In addition Drago, **S59A** should be active during August, mainly CW, signing **3V8DX**. This should give you another couple of chances to work 3V, Tunisia.

Note: Karane, **YT1AD** reports that the **3V8AA** cards should have been put in the mails by the end of July.

JA2PDQ is now QRT from the club station where he signed **3V8BB.** He was very active during his stay.
QSL Route for **3V8BB**: **JF2EFA**

Angola, D2

Peter, **ON6TT** was in Angola until late August and hoped to be able to get on the bands during his stay. Certainly, whilst in the capital Luanda, he expected to be able to operate his morning and evenings, hopefully with a bit more activity during the weekends.
QSL route: **ON5NT**

Jordan, JY

It is reported that King Hussein, **JY1** has been active recently mainly on list operations with either Mary, WA3HUP or Amir, 4X6TT as control stations. Frequency given is 14,240 kHz.
QSL Route: **WA3HUP**

Western Sahara, S0

There seems to be quite a bit of activity from S0 lately and **S01MZ** was a new call for me. Good signals at 2115 UTC on 20 metres short path, and Mahafud was working the pile-up very professionally.
QSL Route: **EA2JG**
QSL Route: **S07URE** recent operation: EA4URE, PO Box 220, 22080 Madrid, Spain.

Note also that Tim, **4U/KCØPA** continues active and is probably your only chance of a CW QSO with this country. His Morse is slow but reliable.

Bahrain, A9

Adam, **A92MM** is reported to be very active on 20 metres SSB running a bit of power and a beam.
QSL Route: PO Box 116, Manama, Bahrain

Don, **A92BE** remains very active, and was very loud on the long path the other day at around 0430 UTC on 20 metres SSB. He is making a start to getting ready to finish his stay in Bahrain in a few months time.

Special event stations

Hungary: HA1ØØGR was over S9 here on 20 metres SSB at 2125 UTC the other day. The callsign is being used to celebrate 100 years of radio.
QSL Route: HA1KSA, PO Box 79, Gyor H-9002, Hungary.

Australia: Nearer to home, **VI5ØPEACE** will be active to commemorate the end of WWII. There will be a special certificate available for $5.00 for stations contacting VI5ØPEACE.
QSL Route: PO Box 829, Hervey Bay, Queensland 4655

Argentina: QSL the following special LU callsigns via Sergio, **LU1AR: LRØA**, **LQØA**, **LVØA**, **LTØA**, **LQ5C** and **LR1C**.

Sergio Daniel V Temporini, LU1ARL, PO Box 454, CP 100 Buenos Aires, Argentina.
AY1A QSL via LU4AA
L3HL QSL via LU3HL
L4ØV QSL via LU1VV
L5P QSL via LU1PAA
LTØN QSL via LU2NI
LRØN QSL via LU2NI
L37N QSL via LU2NI
LR1C QSL via LU2NI
Note: LU QSL Bureau address is: PO Box 97, CP 1000 Buenos Aires, Argentina.

Svalbard, JW

Dominik, **JWØK** should have been active until mid-August from Svalbard, and was travelling around the island with a scientific expedition. He operated CW and RTTY. **QSL Route**: **DL5EBE** Direct or via DARC.

Andre, **JWØC** is also active from Svalbard and by all accounts has a good station, even a rhombic which operates 160 and 80 metres. Now this is one I would *love* on 160 metres for Zone 40!!!
QSL Route: Andre Kravtsov, JWØC, 9178 Barensburg, Svalbard, Norway.

Sao Tomé, S92SS

Note a correction to QSL information previously being circulated:
QSL Route: **S92SS,** PO Box 522, Sao Tomé, West Africa.

Nepal, 9N

Good news is the idea of a club station in Nepal using that familiar **9N1MM** call sign which was used by Father Moran (now a silent key) for so many years. Its seems to me to be a wonderful way to keep this callsign alive, and this memorial station should be on the air by September.

Of course activity from Nepal has been fairly good in the last couple of years as amateur radio is in place in the country.

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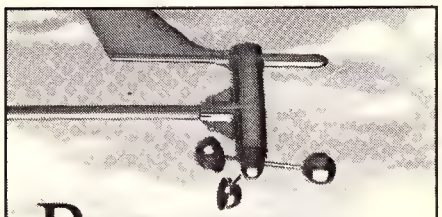

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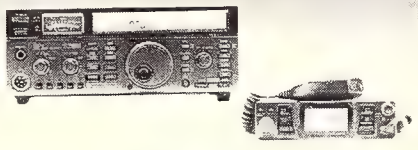

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Mauritania, 5T

Eric, **5T5JC** continues to be very active from Mauritania and usually has an excellent signal on whatever band I hear him. However, it was nice to work him on 40 metres using his special call sign **5T6E** which he was authorised to use until August 25.

QSL Route for 5T5JC, 5T6E: F6FNU

DXCC news

One of the most significant faxes of recent times was recently received here from the ARRL DXCC. The DXCC release, dated July 6, was a landmark — **North Korea** (the People's Democratic Republic of North Korea) an addition to the DXCC Country List.

QSL cards are acceptable at DXCC desk for credit starting October 1, 1995. Note that any cards received before this date will be returned.

DXCC DESK NEWS has the following info: There were 282 unprocessed applications as of June 30. There were 544 applications for endorsements or new awards (sorry, the card total not given). Applications were being returned in less that a week.

(PS There is a rumor that the ARRL board will review certain recent DXAC decisions. We shall see.)

CIS QSL bureau addresses

It seems that QSL bureaus are gradually becoming 'normalised' in Russia and the CIS. The following information should help you get that QSL card to the right place:

4K Azerbaijan PO Box 165, Rostk Dvpsto, 4K7DWA, Baku, 37000, Azerbaijan. **4L Georgia,** PO Box 1, Tbilisi, 380002, Georgia. **EK Armenia** PO Box 22, Yerevan, 375000, Armenia. **ER Moldavia** PO Box 6637, Kishinev-50, 277050, Moldavie. **EU Belarus** PO Box 469, c/o EU1AO, Minsk-50, 220050, Belarus. **EX Kirghiz** PO Box 1100, ARUK, Bishkek, 720020, Kirghhizie. **EY Tadjikistan** PO Box 303, TARL, Glavpochtamt, Dushanbe, 734025, Tadjikistan. **EZ Turkemenistan** PO Box 555, TARL, Ashgabat, 744020, Turkmenistan. **UA Russia** PO Box 59, URR c/o RZ3AZO, Moscow, 105122, Russia *or* **UA Russia** PO Box 88, CRCRF, Moscow, 105122, Russia. **UK Uzbekistan** PO Box 0, Tashkent, 700000, Uzbekistan. **UN Ukraine** PO Box 112, UARL, Kiev-1, 252001 Ukraine.

St Paul Island, CY

The planned DXpedition to St Paul Island finally came to fruition. Murray, **WA4DAN** and his group start up on July 27 and remained active until August 2. This was an all-band operation, with each operator signing **own call/CY9**.

QSL Route for all stations: Murray Adams, **WA4DAN**, 403 E 14th Street, Greenville, NC 27959, USA.

Trinidade, PY/T

Trinidade Island, the bane of many VK/ZL DXers, is active once again, and Sergio, **PU1LOK** is on the island signing **PUØTRI** as I write. Operation is to be on SSB only, and he is there until October. He will QSL after he returns home on completion of his assignment on the island.

QSL Route: Sergio S Mendes, **PU1LOK**, Rua Visconde de Santa Isabel, 692 Apto 202, Grajau, 20560-121 Rio RJ, Brazil.

Activity from VP8 call areas

Andy, **VP8CQS** on the South Shetlands, is very active on 40 metres SSB/CW. I worked him the other morning on 7005 kHz CW at 2130 UTC and he had a good signal here.

QSL Route: **DL1EHH**

Steve, **VP8CQC** is in Antarctica and stationed at Faraday Base and he has been active on 20 metres SSB.

QSL Route: Steve Cuthbertson, VP8CQC, c/o Faraday Base, via Port Stanley, Falkland Islands

Andy, **VP8CRT** has been a regular on 20 metres SSB at around 2000 UTC lately, usually above 14,260kHz. Andy is on the Falkland Islands and has a great signal, and usually has quite a pile-up in attendance.

QSL Route: **G4XYG**

Saudi Arabia, HZ

Mike, **7Z5OO** is in Saudi Arabia for one more year after a contract renewal. He is very active on CW and already has some 27,000 QSOs in his log.

QSL Route: **W1AF**

HZ1HZ: It is reported by Dick, **N7RO** that portions of the HZ1HZ logs have been lost. He is in the process of getting replacement logs for October 1994 to May 1995.

So that is about it for this issue. It has been a few weeks to remember, and the events certainly keep the DXCC program alive and kicking. Libya active, North Korea a new DXCC country, more operations from Tunisia... is the stuff of DXing. Just think that in a few short months we may be right at the bottom of the current sunspot cycle... and when that moment arrives there is only one way for propagation to go!!

To the many DXers who keep me informed on the bands, by telephone, fax and cryptic notes on QSL cards, you have my thanks as always. In particular thanks is due to the following DX outlets: **QRZ DX**, **DX News Sheet**, **Les Nouvelles DX**, **Inside DX**, **Lynx DX Bulletin**, **NJDXA Newsletter** and many more.

73 Jim VK9NS

ISLANDS ON THE AIR (IOTA)

By Jim Smith, VK9NS

It has been an eventful few weeks in the IOTA program, with two new island numbers being allocated for recent activity.

With any DXing, the band conditions play an important role, and in particular I find that Europe seems to be hard to work. There have been several EU IOTA numbers active which most of us in the Pacific need. However they have been unheard or untouchable here. It is interesting to note propagation conditions when a European is S8 in Tasmania (VK7BC) but more or less inaudible here.

However, the crunch will have come at the end of July with the running of the IOTA contest on the last weekend of 29/30th July.

The number of islands which were to be active (or where people had said they would be active) was considerable. Here in the VK/ZL Pacific area, most of us were hoping that we might work a few 'new ones'. Of course, as I'm writing this a couple of days before it starts, I don't yet know what happened to the propagation conditions during that weekend...

I would like to see (or should that be hear?) much more IOTA activity on 40 metres as these days I think it is the band to be watched. Signals are often very good, and even with a modest antenna there are contacts to be made.

The following activity is from my log book so it does show what is around. It is always worth keeping an ear on 14,260 kHz.

AF-004 EA8AFJ Canary Island .....QSL EA8AFJ
AF-016 FR5DX Reunion Island .....QSL see below
AF-019 IG9/IK8AJC Lampedusa Island .....QSL IK8PGE
AF-019 IG9/IK8PGE Lampedusa Island .....QSL IK8PGE
AF-027 FH5CB Mayotte Island .....QSL see below

AS-002 A92BE Bahrain Island .....QSL see below
AS-018 UA0FAI Sakhalin Island .....QSL UA0FAI
AS-020 BV9G Green Island .....QSL BV8BC
AS-120 C4MI Moullia Island .....QSL 5B4KH
.....(see below)

EU-019 R1FJZ Franz Josef Land .....QSL DF7RX
EU-034 ES0YO/0 Saaremaa Island .....QSL ES6DO
EU-047 DL3KBC Borkum Island .....QSL DL3KBC
EU-078 ED3IM Medas Island .....QSL EA3CCN
EU-085 UA1ZFQ/1 Kolguyev Island .....QSL UA1ZX
EU-088 DG2TM/OZ Kattegat Island .....QSL DG2TM
EU-088 DL2SWW/OZ Kattegat Island .....QSL DL2SWW
EU-089 CU9V Corfu Island .....QSL CU3AV
EU-091 IJ7/IK7IMO Sant' Andrea Island .....QSL IK7IMO
EU-132 SP2CYS/1 Wolin Island .....QSL SP2CYS

NA-010 VF1L Cape Breton Island .....QSL VE1AL
NA-015 KG6AG Guantanamo Bay/Cuba .....QSL KK5QO
NA-044 NU2L/VO2 Island of Ponds .....QSL G3ZAY
NA-057 N7QXQ/HR6 Rotan Island .....QSL NA7X
NA-071 3F3C Coiba Island .....QSL HP2CWB
NA-083 K4GLU Chincoteague Island .....QSL see below
NA-087 W5BOS/KL0 Popof Island .....QSL W5BOS
NA-105 FS5PL St Martin .....QSL FS5PL
NA-155 DK6AO/TI6 Uvita Island .....QSL DK6AO
NA-173 VE8/KD2JR Long Island .....QSL see below
NA-196 VE8RAC Belcher Island .....QSL VE3VGI
NA-197 NL7TB/P Fox Island .....QSL NL7TB
NA-198 VO1SF Sth Twillingate Island .....QSL see below
NA-205 NU2L/VO2 Anniowaktook Island .....QSL G3ZAY

OC-009 KC6YK Palau Island .....QSL NH6YK
OC-010 V63BP Ponape Island .....QSL JF6BBC
OC-017 T30DW Tarawa .....QSL see below
OC-028 V73C Kwajalein .....QSL N4GAK
OC-031 C21DJ Nauru Island .....QSL see below
OC-031 C21NJ Nauru Island .....QSL see below
OC-031 C2IJJ Nauru Island .....QSL see below
OC-048 ZK3RW Tokelau .....QSL ZL1AMO
OC-067 FO0PRI Leeward Group .....QSL K2QXS
OC-129 OE5LW/DU5 San Pedro Island .....QSL OE5LW
OC-130 OE5LW/DU9 Cebu Island .....QSL OE5LW

SA-002 VP8CRT Falkland Island .....QSL G4YXG
SA-026 PY5LL Santa Caterina Island .....QSL PP5LL
SA-026 PY5ZYZ Santa Caterina Island .....QSL PY5ZYZ

New IOTA numbers

Add the following numbers to your IOTA Directory as shown below:

Canadian Islands VO2:

NA-205 little c. Newfoundland Province (Labrador) Center Group Adlavak, Okak Islands.

Philippines:

OC-207 little b. Caygayan Island, Tubbatha Reefs etc.

QSL information

5B4KH PO Box 5089, Nicosia, Cyprus.
C21DJ Darkey Jeremiah, PO Box 217, Rep of Nauru, Central Pacific
C21JJ PO Box 518, Rep of Nauru, Central Pacific.
C21NJ Norman Jeckane, PO Box 205, Rep of Nauru, Central Pacific.
FH5CB PO Box 50, 97610 Mayotte Island, via France.
FR5DX PO Box 20, 97430 Tampon, Reunion Island, via France.
K4GLU Alan Merriman, PO Box 734, Chincoteague, VA 2336-0734, USA
T30DW David, PO Box 29, Bairiki, Tarawa, Rep of Kiribati.
VO1SF James Watkins, PO Box 455, Twillingate, NS A0G 4M0, Canada

So, for the moment, Happy Island Hunting! 73 from Jim, VK9NS

The **Delta Tango International DX Group**

...a new kid on the block

By Jack Haden, VK2GJH

Just the other month I received an information package from the United Kingdom outlining the activities of the Delta Tango International DX Group from Lancashire. To be perfectly honest with you, I had never even *heard* of the group before this bundle of information arrived, but as we know, clubs come and go all the time on 11 metres...

Current trends...

Over the past decade or so, we have seen numerous DX clubs catering for the international CB DXer pop up with various pomp and glamor amongst other hype, then fade away from 11 metres like a dying star. The majority have folded up shop and are little more than memories to most, some bitter — especially if some of your money disappeared with them.

The majority of the 'mega' international CB DX clubs seem to be either based in, or founded in Italy or elsewhere in Europe. Once upon a time it was America that was home to the international CB DX clubs, but that was before the single sideband mode and 27MHz made its presence felt in Europe. As the hobby was well on the wane in America the flowers of CB were just beginning to blossom in Europe, with SSB making DXing a whole new ball game to the Europeans. They embraced it rapidly and enthusiastically.

So *another* club out of Europe is with us, although I'm not too sure on just how long the Delta Tango has been in circulation. It cannot have been too long as I don't recall hearing any of their members about the Asia/Pacific region, although the club journal tells me it boasts a member in Japan. However, I am really impressed with their prospective members package that arrived here. Clearly a lot of thought and good hard work is being ploughed into this new entrant into the world of 11 metre DXing.

The club journal

The most eye-opening part of the package was the groups bi-monthly newsletter, which resembles more of a magazine and in some ways reminds me of our recently retired friend CB Action. Called *Network News*, its 30-odd pages are packed with information covering quite a few aspects of radio communications in general, and unlike some overseas DX publications this one is in the Queen's English! I especially took to the Handy Hints section where remedies are given for common transceiver problems, primarily European brands I had never heard of before.

Did you know if you have no audio on the AM mode of a Cobra 148 or Superstar 360, and everything else works fine, then your problem could lie with component 1012 on the right hand side of the circuit board which causes the TX/RX not to work? Works on SSB but no AM? Replace TR-51 with TIP4z or BD712(PNP) and your problems should be over, according to Handy Hints in *Network News*.

Computer buffs are well catered for too. The latest program news, mostly dealing with logbook and amateur radio-style programs, is quite good reading if you're into computers and radio as a partnership. They discuss 3201 PC HAM and other items related to 'shareware' along with printing QSL labels, cards plus other odds and ends.

Network News even touches on the subjects of shortwave listening, pirate broadcasters, television DX and utility band DXing to name a few. Some members contribute radio stories, one chap telling his experience on doing programs for the pirate broadcast vessel Radio Caroline in its heyday.

Let's Get Technical is a column I found to be most interesting and I am sure even that those with even the most basic of electronic knowledge would find it easy reading. Topics include the pros and cons of running an antenna matcher in-line all the time, and constructing a simple 10 amp power supply for the shack. It's good to see them encouraging the art of home-brewing.

Although the news is heavily slanted towards the United Kingdom membership as it's a UK-based club, the club journal is still a good read, and like most radio club newsletters carries AGM news, President's Report, Contest and Award News along with DX notes. There's even a Puzzle Page at the rear so you can while away the hours when there's no DX on the band!

Other club 'essentials'

As with most DX clubs, new members have no shortage of fancy stationery and other club merchandise to chose from, ranging from pre-printed QSL cards through to frequency charts and tee-shirts amongst others. The lifetime membership card comes in a plastic credit card-style format... minus the magnetic strip though!

The club's DXCC countries list follows that of Alfa Tango. You also get a list of 'Q' codes, how to give accurate signal reports, and a phonetic alphabet list to guide you along. Everything appears to be professionally put together and published — none of the shortcuts or other rubbish I've come across from some other so-called DX clubs.

Choosing your new club

Although most of us here in Australia have already 'settled' with a particular DX club. Whether it's an Australian club such as Tweed Radio or an overseas one like Alfa Tango, there may be some looking for a club with something different to offer a budding DXer. Delta Tango is interested in building up its membership and, judging by its information package, you could do far worse I can tell you.

Something tells me that Delta Tango

may have left its run a wee bit late. With the overall decline in propagation activity on 11 metres, even the well-established DX clubs will be hard-pressed to maintain healthy membership figures whilst people are dropping out due to little radio DX activity to keep their interests alive.

Some clubs are so desperate to maintain members in rare and semi-rare DX countries that they have resorted to giving out club membership packages free-of-charge, complete with callsign too, even though many times the operator in question doesn't want the bloody thing in the first place! I suppose it looks good in their annual callbooks (or 'directories' as most call them) to see those 'members' in such rare prefixes as part of the club.

What have *you* to offer?

When it comes to members, all clubs are the same no matter what the club is about, and CB radio is no exception to the rule. You basically have three categories of members: the ones who work their guts out, who don't make a fuss of it, who make the club a success using their own spare time free of charge. They go out of their way to help others and prepare club activities to maintain momentum and interest.

Then you have the middle-of-the-road members, those who only do things when prompted by others in the club or who surge into activity when they see some quick glory for themselves without too much bother. As the work in question has already been done by the 'doers' in the first category, they just tag along for the proverbial 'free ride' and reap the benefits later.

Finally you have the users, bludgers and whingers. This group usually does the club more damage than good, taking everything for granted, contributing as little as possible and back-stabbing others. They complain on air long and loud, but rarely turn up at meetings to follow things through, generally thinking the all the club officials are 'on the take', so to speak, and don't give a tinker's cuss about them. Every club has them — the take-all-give-nothing fraternity.

So what type of member will *you* be in your new club? Are you just going to join up because it's the biggest club in the world and you just want a callsign and directory every year? Or are you going to offer yourself as a supportive member, ready to help, provide input and attend as many meetings as possible? (A bit hard if the club meets in Pommyland, though...)

I hope that Delta Tango has better pre-membership ethics than some of the other so-called clubs about. I have had so many 'free callsigns' all because I operate from some rare Pacific islands from time to time — in fact, I've lost count of them.

Membership in this club anywhere costs UK£8 or US$16 per annum, and includes postage costs and the like. The membership material states that Delta Tango is a non-profit organisation.

The Australian connection

Although there is no mention of an Australian chapter of Delta Tango, there well may be by the time you read this. Not wanting to sound too harsh, I would tend to wait to see what happens with Delta Tango, but there is no harm in writing to it for information.

Most clubs tend to succeed more in this country when an Australian chapter is formed and thus members can chat on air either locally or when interstate DX is about. There's nothing worse than being a member of an overseas club and not having some fellow members in Australia to chat with and compare notes.

Still interested? Then drop a line to **Delta Tango, PO Box 174, Preston, Lancashire, PR1 0BS, England** and see what eventuates. If it's anything like the sample membership package I have here then I'm sure you won't be disappointed.

Delta Tango may not be a super-big mega club with members in every DXCC country, but it seems genuine and determined to succeed, despite ailing DX conditions being experienced around the world.

More info...

I have a number of Delta Tango general information leaflets here, and you're welcome to one provided you send a stamped, self-addressed envelope to **Jack Haden, PO Box 299, Ryde, NSW 2112.**

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Realistic PRO-62 hand-held scanner

At *last* it's here...

By Russell Bryant

Annoying images are a thing of the past! The PRO-62 from Tandy offers triple conversion and a host of other features...

An interesting fact — almost all purveyors of scanning radio receivers acknowledge that hand-held scanners out-sell all other types by about three to one.

Their versatility alone makes them the ideal scanner for all seasons and situations. Hand-helds can substitute for a base scanner at home or even a mobile in the car, yet allow portability when required.

Size to consider

One of the problems associated with 'portable' scanners in the past has been their size. You simply could not fit all the shielding and up-market electronics of the base or mobile units into something a fifth or so the size of the base unit. One part of this new-age electronics is an improved first IF, or first conversion frequency. Until recently, the most common first Intermediate Frequency in scanners was around 10 MHz.

Depending on the manufacturer and the IF frequency used, image signals would be evident at 21.4, 21.6 or 21.8 MHz above the actual frequency. Images are produced in every receiver, irrespective of their design or cost. However, by employing various conversion methods, such as higher first IF frequencies, images can fall outside the normal tuning range of the receiver.

Hot seller

A couple of years ago, Tandy released to the American market the PRO-43 hand-held scanner. To say it proved successful would be the understatement of the season. Stocks literally sold out in some areas within *days* of them arriving in the stores.

The reason why? To look casually at the PRO-43 certainly would not give you a hint, as it was aesthetically very similar to other Tandy scanners. But when you switches it on, it was another story. The PRO-43 offered triple conversion, with the first IF around 608 MHz. It supported the usual frequency ranges of 30-50 MHz, 118-174 MHz, 220-512 MHz as well as 806-1000 MHz, minus cellular. Users could select either AM or FM when programming any of the 200 frequencies. All this, combined with a price of $US350, made it an inexpensive travelling companion.

Alas, we in Australia were not to see the PRO-43. For some reason it sold only in America, with a few filtering through to the UK. Well, Realistic has made amends — the **PRO-62** is here.

Three times as good...

Firstly the PRO-62, like the PRO-43, utilises triple conversion, with the first intermediate frequency at around 257 MHz. Either AM or FM can be programmed as the mode for any frequency. As there are a few AM services still operating in the predominantly FM bands, this is a handy feature.

Any frequency from 68-88 MHz (in 5 kHz steps), 118-136 MHz (in 25 kHz steps), 137-174 MHz (in 5 kHz steps), and 380-512 MHz or 806-960 MHz (both in 12.5 kHz steps with no gaps for the missing 800 MHz cellular band as required by law in the US), can be programmed into any of the 200 memory channels.

One of the things I like about Realistic scanners, irrespective of the model you have in your hand, is that they are easy to program. With minor differences — depending on their manufacturer — the key strokes are identical.

Enough about what's going on inside, it is performance that sells scanners. The PRO-62 performed to spec. The handbook lists sensitivity at less than 1 µV (microvolt) across the entire reception range of the unit. Actually, that's not a lot of help if you want to know the highs and lows of the different bands. On the model supplied for testing, UHF came in a whisker over .35µV, with VHF slightly higher at .4µV. Effectiveness on 800 MHz and AM bands varied between 1 and 1.5µV respectively.

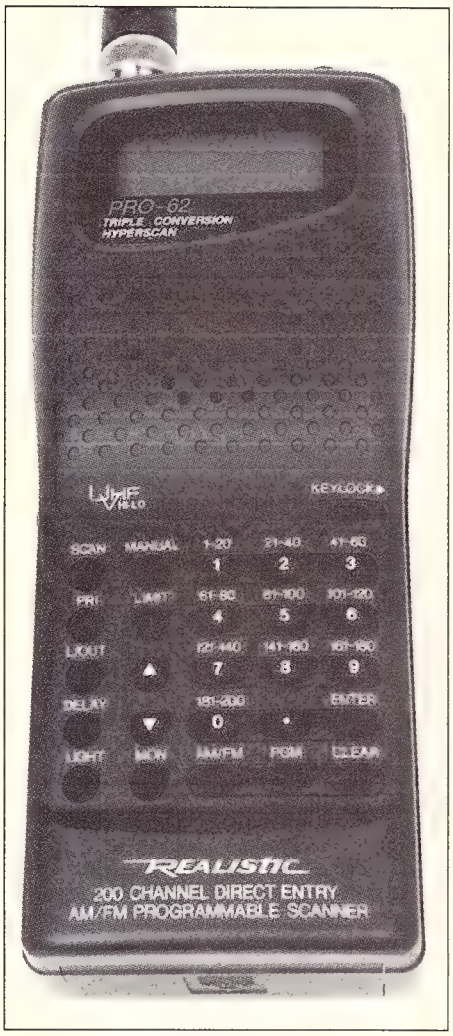
Handles the hot stuff

Generally, and almost without exception, the PRO-62 was able to handle some pretty hot RF areas, mainly due to its conservative sensitivity figures. Only once during my testing did it suffer from front-end overload. Given that it was connected to a 12dB gain Yagi (pointing directly at a major repeater site pumping out unknown amounts of RF energy) I was not alarmed or surprised by this one indiscretion.

As with its bigger desk-bound relative, the PRO-62 has Hyperscan. This proprietary feature hots up the action by zipping through the programmed channels or searching new frequencies at 25 channels per second. I remember some of the earlier scanners available years ago... they scanned at eight channels per second. I though *that* was fast!

Listen hear

Audio output from the center-mounted speaker is around 200 milliwatts, which is just enough for most listening applications. If, however, you find that you can't hear the action, a standard 3.5mm jack is provided for earphone or remote speaker connection. The full-featured LCD display has side illumination for low-light operation. The keyboard can be disabled to prevent accidental misuse.



The supplied aerial is the now-familiar broadband rubber duckie. These antennas have developed from the old heatshrink-coated stainless springs, into injection-moulded, multi-band heavy-duty whips of today. Should you desire to couple the PRO-62 to an external base or mobile antenna, a BNC connector is furnished.

Is size really important? To certain members of our community, it is. Portable or hand-held scanners are just as the name suggests: *portable*. Sometimes the need arises for the radio to be transported in a pocket. While jeans or trouser pockets are no problem, rarely is a shirt pocket reenforced sufficiently to carry the average (hand-held) scanner. The PRO-62 weighs in at a comfortable 400 grams, stands less than 15cm high, and is around 6.5cm wide by 4.5cm deep.

Economy plus

Many hand-held scanners on the market today chew up power like a V12 Jaguar uses petrol. Tandy scanners have a reputation for being rather thrifty (current drain is quoted at 95 mA) when it comes to current consumption.

Using good quality NiCds, 10 to 12 hours listening time is not unreasonable. A friend of mine, who is one of the lucky few Australians to own a PRO-43, managed over 20 hours of operation using a set of six generic AA dry cells. It would be safe to assume that the PRO-62 would do the same, or better from branded dry cells or the new nickel metal hydride rechargeable batteries.

As always, provision is made for the attachment of external power from a 9VDC source.

Speaking of reputations, one other thing Tandy is known for is the calibre of its operating or instruction manuals. Without exception, the one accompanying the PRO-62 does the job admirably.

A belt clip is the only other accessory furnished.

In conclusion

Now the cruncher: How much would you expect to pay for this scanning package? Less than $500.

As a first scanner, I would recommend the PRO-62 without hesitation. For the experienced scannerist who thinks the PRO-62 is not worthy of consideration, think again buster. The PRO-62 is a top-shelf scanner at a middle-shelf price.

R&C thanks Tandy Electronics for the loan of the review scanner.

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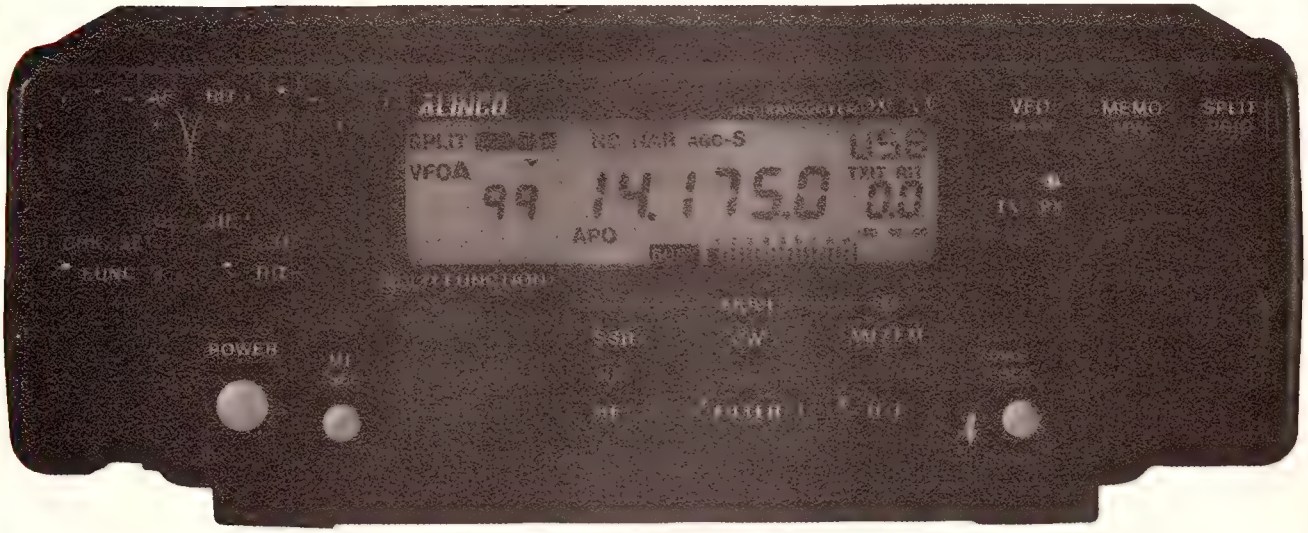

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DX with your scanner? It's possible!

By Jason Reilly and Michael Evans

Using exotic modes of radio communication doesn't mean you need exotic gear, as Jason Reilly and Michael Evans show.

How far away can you communicate using your UHF CB? 100 km if you're lucky? Maybe 150 km with a repeater? What about scanning? What's the most distant transmission you have ever received? 100 km again? Chances are that these will be fairly typical distances...

What if I told you that communication via UHF CB and reception of signals on a scanner could be possible over 500-1000 km? You'd probably think that I was having a lend of you. Well, it *is* possible, and while 1000 km might take some time and effort with a bit of luck thrown in, 500 km is easily achieved.

So what's the magic involved here? It's not magic, but it does have a name: **tropospheric ducting**. This describes a mode of radio wave propagation which occurs under the correct conditions. You may have heard some people talk about this before. Some call it 'inversion' or 'tropo', or even just 'ducting', but it all means the same thing. It means that transmission and reception of radio waves is possible over far greater distances than is normally possible.

Tropospheric ducting is caused by weather conditions most often found during summer. Normally, as you increase in altitude above the earth, the temperature drops in a fairly predictable manner — about one degree Fahrenheit for each 500 feet is the old rule I learned in school. But under some weather conditions, the upper part of the troposphere (the lower layer of the atmosphere) heats up more than the lower parts, and a 'barrier' called a temperature inversion layer can develop.

The change in air temperature is quite sudden as you pass through the inversion layer — as much as several degrees. In a smoggy city you can often see the inversion on the horizon (a dead giveaway!) as a line of dirty air under a clear sky.

The weather conditions that set these 'inversions' up is several days of calm, clear weather, most often found in summer — but it is far from unknown to happen in winter, either.

So what you wind up with is a layer of cool air sandwiched between two warmer bodies — one being the earth, the other being the warmed upper part of the troposphere. This forms a kind of 'duct', or conduit. This duct is a bit like a water duct, which carries water from one place to another. In our duct formed by the temperature inversion, the duct carries something that interests us greatly. Radio waves (oh, and sound!)...

This works in a similar fashion to an optic fibre. A thin glass fibre is coated with a cladding of glass of a different density. When light is sent down the central glass fibre, the light tries to escape, but it instead strikes the outer glass cladding, and being of a different density (different refractive index) it 'bends' (refracts) the light back into the fibre. This enables the light to be carried for a very long distance with little attenuation. Our radio wave does much the same thing. The radio wave might try to escape the duct, but because of the different density of the earth below, and of the warmer air above, it is refracted back into the duct. The result is the same — radio waves can be carried for great distances, with little attenuation.

Such a duct is often set up over Bass Strait during the warmer months, and makes possible for Tasmanians to communicate with and scan Victorian stations with relative ease. (It is these same ducts which used to play merry hell with the microwave radio links that Telecom uses to link Tasmania with the mainland. My own personal experience and some research has given me a few clues as to how best to scan far away stations from other states.)

Other well-known paths are from the central coast of NSW to New Zealand and Victoria to South and even Western Australia. Amateur radio operators often work from Australia to New Zealand on their two metre and 70cm bands during summer, and have regularly exceeded 2000 km on bands higher than 1200 MHz using ducting.

And these experiences apply equally for DXing using this exotic phenomenon on UHF CB...

Tropospheric ducts form during extended periods of fine, clear and usually warm weather. Spring, summer and early autumn are the most prolific seasons, but again, winter ducts are not impossible. Once some wind blows up, or a weather front passes through, the ducts usually soon disappear. Just before a cold weather front passes through, the duct may appear to become stronger. This is due to the cold front pushing cooler air ahead of it near the surface of the earth, but still leaving the warmer air above.

An early warning that some ducting might be taking place, or building up, is to listen to the FM broadcast band. The powerful broadcasters are usually the first to be heard in an area where they normally don't reach. If you are hearing a strong signal from a station that you don't normally hear, it may be time to tune around on the scanner, or place a call or two on the rig.

If there is no immediate success, try a little while later. As the day goes on, the ducts usually get stronger, but start to weaken a few hours after the sun has set. The ducts may disappear altogether overnight, or they might just become weaker. Generally speaking, early morning and early evening produce the best times to listen if conditions are marginal.

It also happens that these times are also the best times for another mode of communication to happen: **Sporadic-E**. This mode also has the effect of delivering to you radio waves from afar, but generally affects the VHF bands more. CBers should note that the effect rarely makes it above 400 MHz, unfortunately, so you're unlikely to find the effect on UHF CB. But amateurs and scanner users should be in their element!

Occasionally, ducts will be set up that are so strong, they will last well into the night. I remember one night at around midnight, thinking "I'll just switch on the scanner for a moment..." and found signals leaping out of the scanner that I knew were not local. They weren't local to the tune of 300 km!

Your location in relation to the duct is vital. You need to be *in* the duct, or have an antenna capable of propagating strongly into it. Fortunately, most ducts occur at around

ground level, and extend up some distance. This distance can be quite variable. It could be as little as 500 metres, or as much as 2000 or more. Quite simply, if you are outside the duct, you won't hear much. There is no easy way to tell if you are in the duct or not (unless you can physically see it thanks to the smog, of course) except by listening out for a station that you know isn't local.

Areas of flat land, or salt water, are prime areas for duct production. Ducts don't form well over mountainous or hilly terrain. Having a cliff or hill overlooking the sea is almost guaranteed to be the best location for using any ducts that may form.

A mountain top that has its horizon overlooking the sea is another good choice, but being *too* high up may put you outside (above!) the duct. If the ducts are strong, an inland hill with a clear view to the horizon will generally produce good results. Or if the ducts are really strong, just about anywhere elevated will do.

Equipment can be as fancy or as simple as you like. While having a high gain antenna is helpful, especially if you have a Yagi array, it certainly isn't essential. I have achieved excellent results using just a UHF quarter wave antenna sitting atop my scanner. I reckon 300 km reception is quite good for a quarter wave telescopic whip!

If using a hand-held in an unfamiliar place to scan a duct or two, you may notice that if the ducts are weak, the position of the scanner can make a big difference. You can try using a relatively flat surface as a backplane reflector to help enhance signals. A metal plate, a bit of roofing iron, a brick wall... any of these may help.

While scanning/communicating, sometimes the duct may appear to fade out fairly quickly. Don't despair, it will probably be back very soon — less than 10 minutes. Sometimes ducts will fade out, leaving another duct to bring in signals from a different location. As an example, I could be listening to eastern Victorian stations one minute, and then be listening to western stations the next, from my home state of Tasmania.

The Tasmanian Connection

Here in Tasmania, there is not quite as much radio activity as there is in Victoria, so it comes as a real treat to the Tassie scanner to hear so much so easily. A good indication that ducting is taking place (apart from hearing the Victorian FM broadcasters such as JJJ-FM on 107.5 MHz or TT-FM on 101.1 MHz) is that the Vic Police UHF allocation is active.

In Tasmania, only two of the 64 channels are used, so it makes identifying 'foreign' stations very easy. Besides, the callsign VKC gives it away. Since the repeaters are usually in high places, and output upwards of 50 watts, and as well as the land around Melbourne being fairly flat, makes this band one of the first to 'open up' to Tasmania. Other stations to listen out for are the ambulance allocations on 412-413 MHz and air-band stations.

As the ducting becomes stronger, more and more stations can be heard, and sometimes becomes so strong that interstate simplex stations sound almost local. UHF TV audio can be heard most times and, if the duct permits, even some 800-900 MHz stations appear.

Quite often you may find that the duct will carry signals up to a certain frequency band, and above that, *nothing* is to be heard. This is because the higher frequencies require a 'stronger' duct (a greater temperature differential) to prevent them from escaping. For most of the time, however, the ducts will carry signals up to about 500 MHz.

As mentioned before, very strong ducts form over Bass Strait. Some excellent places to go to if you want to make use of the ducting across the water in Tasmania are: Round Hill at Burnie, Montumana Hill halfway between Smithton and Burnie, The Bluff at Devonport (all these places overlook the water, with some altitude), and Mt George should produce good results.

For those in Launceston, West Launceston hilltops or St Leonards hilltops are good when the ducts are reasonable. Mt Arthur or Mt Barrow are both good if the ducts extend up to 1500m high. Incidentally, both these sites can produce results even if there is no ducting at all, given a high gain Yagi and a sensitive receiver.

Also, the hill overlooking Waterhouse Island, near Bridport is another good spot. On either King or Flinders Islands, anywhere to the north of the island will do. For those in southern Tasmania... well, you'll just have to make a weekend trip up north, because the ducting rarely gets far past the coast.

Looking Over The Strait From Victoria

By Michael Evans

One summer's day early last year when it wasn't raining in Melbourne, while scanning around the VHF low bands on the trusty Yaesu FRG-9600, I heard a call go out "VKT Burnie to Bravo 21". This set the mind a-racing. Burnie is in Tasmania... VKT... yes, it was Tasmania.

I quickly zoomed the dial back to 76.700 MHz and, sure enough, there they were, as clear as if they were next door. I heard the whole conversation — both sides. I was amazed that my humble antenna was able to pick up such a thing, especially since there was no repeater in use.

That was my first taste of ducting. Since that time I have regularly monitored in particular the Tasmania Police on all of their channels which are in range of 76.085 MHz — 76.700 MHz. In Victoria many of those channels are used by the Victorian Ambulance Service, so they occasionally get wiped off the old dial, but none the less they are there. Night time in Melbourne is the best time for long distance monitoring as many of the usual radio services in the RF jungle that is Melbourne disappear.

I have also monitored activity from time to time on 76.385 MHz (Tasmanian SES) and 77.090 MHz (Launceston City Council). You would find that most of the communication from Tasmania is on the VHF mid-band.

My monitoring set up is humble, consisting of my trusty Yaesu FRG-9600 scanner complete with a discone on the roof, about 40 feet up in the air and some RG213 cable connecting the two together on a cable run of about 15 metres.

The signals are all out there — all we have to do is find them and drag them in!

Conditions To Look Out For

- **Several days of warm, calm weather**
- **FM broadcasters being heard from further than normal**
- **Check the local UHF CB repeater for interstate activity**

SHORTWAVE LISTENING

All times are expressed in Co-ordinated Universal Time (UTC or 'z'). Add 10 hours for Eastern Standard Time, 9.5 hours for Central Standard Time, 8 hours for Western Standard Time and 12 hours for New Zealand Standard Time.

DAB — way of the future?

Digging out weak shortwave signals can be an engrossing and addictive pastime but, let's face it, the medium has its limitations when one is interested only in program content and entertainment value. Enter **DAB**, or Digital Audio Broadcasting, which has for some time now been touted as the logical successor to the crackle and hiss of shortwave as we know it.

Just as the compact disc has become firmly established as the major source of high quality sound in the home, so do the promoters of DAB hope that receivers will soon boast a separate DAB position, alongside the traditional medium wave and FM bands. DAB promises uniformly good reception in the home or car, and has been tested under the most difficult conditions. Consistent stereo sound quality is possible, with economical frequency spectrum usage.

From a purely technical point of view, the progression to DAB need not be too far away, and some of the larger international broadcasters had originally planned to conduct tests as soon as the latter part of this year. As with most things, the stumbling block has been the bureaucracy, with difficulties encountered in reaching agreement on frequency allocations for DAB.

DAB uses a digital signal — a series of zeros and ones (off and on) — in much the same way as computers or compact disc players, rather than the continually-varying analogue signal utilised in shortwave, FM and medium wave broadcasts. The digital signal is inherently resistant to the cumulative noise and distortion that plagues analogue signals.

Additionally, a method of bit-rate reduction has been devised which enables a high quality audio signal to be broadcast using only a fraction of the audio bit-rate of compact discs, therefore minimising the frequency bandwidth required.

Interference from reflected or multi-path signals has been overcome using a method known as **COFDM** (Coded Orthogonal Frequency Division Multiplex), which uses hundreds of carriers packed closely together in frequency, instead of the conventional single carrier. A number of programs are transmitted together, interleaved in time and frequency, achieving the desirable level of stability and spectrum efficiency. The multi-carrier approach has the advantage of the data for each radio service being spread across a number of carriers, minimising interruption to any program if one of the individual carriers becomes subject to bad interference.

International broadcasters will no doubt use satellite delivery of their DAB signals, though it is also possible to make use of terrestrial transmitters, perhaps under rebroadcasting agreements. Although much has been said and written about it, expect a transition period of a few years for even the larger stations to be using DAB as their primary broadcasting method.

The rather delayed adoption of Pay TV in this country has meant that the vast majority of the population has little concept of the goodies that satellite technology promises; compact disc quality audio from one's favorite international broadcasters will certainly be one of the highlights — but forget the first-run movies and live sport vision!

Romania in English

Here is the latest schedule for English broadcasts from Bucharest, current until the beginning of November:

0200-0300z 5990, 6155, 9510, 9570, 11,940 kHz to North America
0400-0430z 5990, 6155, 9510, 9570, 11,940 kHz to North America
0530-0600z 11,810, 15,250, 15,340, 17,745, 17,790 kHz to Africa
0645-0715z 11,775, 15,250, 15,335, 17,720, 17,805 kHz to New Zealand
1300-1400z 11,940, 15,365, 17,720 kHz to Western Europe
1430-1530z 11,775, 15,335, 17,720 kHz to South Asia
1730-1800z 11,830, 15,340, 15,365, 17,805 kHz to East Africa
1900-2000z 9690, 9750, 11,810, 11940 kHz to Europe
2100-2200z 7195, 9690, 9750, 11,940 kHz to Europe

Thanks to Jens Sondergard Jensen of Denmark for this information.

Papua New Guinea

PNG's **National Broadcasting Commission** has announced a major upgrade for **Radio West New Britain**, which operates on shortwave 3235 kHz from the town of Kimbe. A budget allocation of two million Kina has been made for the project, funded under the National Investment program.

According to NBC Chairman, Tony Bosce, staff will be moved to a temporary shed whilst refurbishment is progressing. The upgrade of NBC facilities throughout the country was commenced last year with the improvement of Karai service coverage through installation of a 100 kW transmitter, presently heard on 9675 kHz (daytime) and 4890 kHz (evenings to 1200z). Presently, some seven provincial radio services are said to be off air due to outdated equipment in need of parts that are no longer available on the market.

Shortwave from the Czech Republic

Radio Prague has forwarded this (streamlined) schedule for English transmissions:

0600-0627z on 7345 kHz to Europe and on 15,640 kHz to Asia and the Pacific
0730-0757z on 15,640 kHz to East Africa and West Africa
1030-1057z on 7345 kHz to Europe and on 9505 kHz to Asia/Pacific
1600-1627z on 5930 kHz to Europe and on 17,485 kHz to East Africa and the Middle East
1700-1727z on 5930 kHz to Europe and on 15,640 kHz to West Africa
2000-2027z on 5930 kHz to Europe and on 11,640 kHz to the Pacific
0000-0027z on 5930 kHz to North America and on 7345 kHz to the Pacific
0100-0127z on 7345 kHz to North America and on 9405 kHz to the Pacific
0300-0327z on 5930 kHz to North America and on 7345 kHz to the Pacific
0330-0357z on 9480 kHz to the Middle East and South Asia

All transmissions are from Litomysl with 100 kW.

Compiled by Craig Seager cseager@ozemail.com.au
12 Pellion Place, Bathurst, NSW 2795

Publications news

The publishers of the **World Radio TV Handbook** have announced that the second edition of the popular **WRTH Equipment Buyers Guide** has been postponed, and all back orders cancelled.

The revised edition of this publication was originally planned based on advance product-release announcements from several major manufacturers, however a number of these products are still not available, or won't be at least until late 1995.

In the meantime, the current edition still contains much useful information, and is available from major electronics chains and technical bookshops.

Jihad DX is the name of a relatively new shortwave bulletin, which is distributed via the computer network. Complied by US DXer Hans Johnson, Jihad DX is only available to those who contribute useful loggings or news to the particular issue. The information presented appears to be of high quality and the best part of the whole deal is its price: free to the aforementioned contributors. Hans Johnson may be contacted at Compuserve 73042,3644 or via Internet 73042.3644@compuserve.com.

WRMI relays

In addition to operating its own shortwave outlet on 9955 kHz, **Radio Miami International** hires airtime on various US private stations. Jeff White provides this listing of such services:

Monday at 0000-0030z; La Voz de Cuba 21 (in Spanish) via WHRI on 9495.
Mon-Fri at 0700-0800z; La Voz de Alpha 66 (Spanish) via WHRI on 9495
Mon-Sun on 1400-1430z; Forum for Democracy (Vietnamese) via KWHR on 9930 kHz
Sunday at 1630-1700z; Universal Life (German) via WWCR on 15,685 kHz
Sunday at 1730-1800z; Universal Life (English) via WHRI on 13,760 kHz
Mon-Fri at 2200-2300z; La Voz de Alpha 66 (Spanish) via WHRI on 9495 kHz
Mon-Sat at 2300-0100z; La Voz de la Fundacion (Spanish) via WHRI on 9495 kHz

Taiwan schedule

Here is the announced schedule for English from the **Voice of Free China** in Taipei:

0200-0300z 11,825, 7130, 15,345 kHz to Asia and Australasia; 5950, 9680, 11,740 kHz to the Americas
0300-0400z 11,825, 11,745, 15,345 kHz to Asia; 5950, 9680 kHz to America
0700-0800z 5950 kHz to the Americas
1200-1300z 9610, 7130 kHz to the Pacific and Asia (not announced, but confirmed from monitoring)
2200-2300z 17,750, 21,720 kHz to Europe

New HCJB frequency

In a somewhat magnanimous gesture, Gospel station **HCJB** in Quito (Ecuador) has moved the frequency for its South Pacific release to 5900 kHz which, according to frequency co-ordinator Richard McVicar, is to avoid causing interference to the low-powered Bolivian **Radio Santa Cruz** on 6135 kHz. Certainly a refreshing approach from an international broadcaster... HCJB is on air to the South Pacific from 0700-1130z, in English.

Of special interest is the program **Ham Radio Today**, which goes out Wednesdays at 0930z.

Defence station returns

DXers worldwide have for some weeks been hearing an unidentified station on 8127 kHz USB, carrying mostly musical programs. The dedicated folk at *BBC Monitoring* have come up with the answer and have determined that the station is **Galei Zahal**, Israel's Defence Forces Radio, which hasn't been heard on shortwave since the early 1980s.

The station identifies on air as **Kol Ha-Galgalatz** ('Voice of Galgalatz'), and carries traffic information, music and regular relays of news bulletins from **Israel Radio**'s 'B' program.

Galei Zahal has been heard at various times of the day, including at 2000z.

News in brief

• A new Ecuadorian station should provide a challenge for DXers everywhere. **Radio Buen Pastor** (Radio Good Shepherd) was officially inaugurated on July 15 and uses 4830.23 kHz, a difficult frequency due to the co-channel presence of the strong Venezuelan, **Radio Tachira**.

To make things even more sticky, Radio Buen Pastor uses only 1 kW into a double 'lazy H' antenna which beams virtually straight up and down, for greater concentration of signal in areas adjacent to the transmitter site. Located in Saraguro, Loja Province, the station is aimed primarily at Indian populations in southern Ecuador.

Reception reports may be sent to: Radio Buen Pastor, c/o OMS International, Saraguro, Provincia de Loja, Ecuador. Mint Ecuadorian stamps are the preferred return postage (1300 sucres). This news from HCJB's *DX Partyline*.

• **Radio Nadezhda**, the Russian womens' station, hasn't been traced on shortwave for some weeks now, and is presumed to have left the bands, to be heard on medium wave and FM only. Financial reasons are believed to be at the root of this sudden disappearance.

• **Radio Republik Indonesia** at Tual has been drifting about somewhat, and on a recent trip to Fingal Bay in the Port Stephens (NSW) area, I was able to observe the station on successive nights at around 0800z varying between 6152.5 and 6156.1 kHz. The latter occupancy was the cause of some interference problems to Radio Singapore's English service on 6155 kHz later in the evening. Tual's nominal frequency is 5984 kHz.

• Following up on an item published last issue, Peru's **Radio Huanta 2000** has re-emerged on 4747 kHz, after some weeks on 4756 (variable). Sign-on is at 1000z.

• Another bi-product of the Fingal Bay jaunt was long path reception of an unidentified African station on 4795 kHz around 0600z, which has now been positively identified by *BBC Monitoring* as the reactivated Douala station in the Cameroon.

There hasn't been much shortwave activity from the Cameroon lately, with only occasional appearances by Garoua on 5010 kHz; Buea 3970, Baffoussam 4000 and Yaounde 4850 kHz have been somewhat erratic for a long time, due to problems with the transmitting equipment and a lack or parts and money to make the necessary repairs.

• When all is quiet on the 90 metre band except for a few scattered Papua New Guineans, look for one of the few Latin American stations on this band to be audible in Australia *and* operating to a 24-hour schedule.

I'm talking about **Radio Centro**, the low-powered Ecuadorian, which uses 3289.9 kHz from Ambato, in the center of the country. Look for this one as early as 0545z on a good day; it should be audible until past 1200z. Reception of Radio Centro is only possible due to the absence of **Radio Central** (PNG), which is off air due to maintenance problems.

• Chile is rather rare on shortwave these days, but a relatively easy....☞

catch as present is **Radio Esperanza**, a Christian station which operates on 6090 kHz. Best reception is at 0700z, but look out for interference from the Brazilian, **Radio Bandeirantes** (Sao Paulo), which fades in soon after.

Greece

In DSWCI 'Shortwave News', Wolfgang Buschel advises this schedule for the **Voice of Greece**:
0000-0350z 6260, 9935, 11,645 kHz Greek (English Tuesday to Sunday **0130-0140** and **0340-0350z**)
0500-0550z 9375, 9425, 15,630 kHz Greek and Arabic
0600-0650z 9375, 9425, 11,645 kHz Greek and Turkish
0700-0750z 9375, 9425, 11,645 kHz Greek (English 0740-0750z)
0800-0900z no transmission
0900-0950z 11,645, 15,650 kHz Greek (English 0940-0950z)
1000-1150z 9425, 9825 kHz Greek and Turkish
1200-1250z 15,630 kHz Greek
1200-1350z 15,650, 17,525 kHz Greek and Arabic (English **1240-1250z**)
1300-1350z 11,645 kHz Greek and Russian
1400-1450z 9425, 11,645 kHz Greek and Arabic
1500-1700z 9420, 9935, 11,645 kHz Balkan languages
1800-1850z 11,645, 15,650 kHz Greek (English weekdays **1840-1850z**)
1800-2150z 7450 kHz Greek
1900-1950z 9375 kHz Balkan languages
1900-2150z 9425 kHz Greek
2000-2050z 9375 kHz English, French, German, Italian, Spanish
2050-2150z 9375 kHz Greek
2150-2250z 9375, 9425 Greek (English Monday to Friday **2240-2250z**)
2200-2250z 11,595 kHz Greek, Portuguese and Spanish
2300-2350z 9375, 11,595 kHz Greek, Portuguese and Spanish

The relay of the domestic service from Thessaloniki (in Greek) is: **0500-1000z** 9934.7 kHz, **1000- 2200z** 9395 kHz, **0500-2200z** 11,595 kHz, **1700-2200z** 7430 kHz.

Coming soon...

Radio Deutsche Welle, Germany's international service, has announced that in September or October the AsiaSat2 satellite will be launched and positioned on 100.5 degrees East. After a test period of about three months, Deutsche Welle will begin broadcasting its TV programs in German and English, as well as radio programs in German and some Asian languages.

The transmissions will be digitally compressed using the MPEG-2 standard, which was established as the international standard for digital broadcasting in November 1994. Analogue satellite receivers will not be compatible with this technology. The good news is that Australia and New Zealand fall within the signal footprint, though a fairly reasonable dish will be necessary. This news from *Tune In*.

Switzerland

Swiss Radio International in Berne has provided this schedule for English broadcasts:
0100-0130z 5885*, 9885, 9905*, 6135 kHz to Central and North America (East Coast)
0400-0430z 6135, 9885, 9905* kHz to North America (West Coast)
0600-0630z 9885, 13,635, 15,340 kHz to Africa
0900-0930z 9885*, 13,685, 17,515 kHz to Australia and the South Pacific
1100-1130z 9885, 11,640, 13,635 kHz to the Far East and South East Asia
1300-1330z 7250*, 7480*, 11,640, 13,635 kHz to South and South East Asia
1500-1530z 9885, 12,075, 13,635 kHz to South and Central Asia
1700-1730z 6205, 9885, 13,635 kHz to the Middle East and East Africa
2000-2030z 6135*, 9770*, 9885, 11,640, 13,635 kHz to Africa
Relay sites: * Montsinery, French Guiana * China * Moyabi, Gabon * Brazil. This schedule remains current until September 24.

Portugal

Here is the latest available schedule for Portuguese programming from Lisbon:
Monday to Friday:
0400-1200z on 6130 kHz to Europe
0500-1200z on 9780 kHz to Europe
0545-0700z on 9630 kHz to Europe
0900-1000z on 17,595 kHz to Timor
0900-1100z on 17,685 kHz to Africa
0900-1100z on 21,655 kHz to Guinea/Cape Verde/Brazil
0900-1100z on 21,720 kHz to Africa
1300-1430z on 21,515 kHz to Europe
1300-1430z on 9780 kHz to Europe
1300-1430z on 9815 kHz to Europe
1300-1430z on 15,515 kHz to Africa
1300-1430z on 21,655 kHz to Guinea/Cape Verde/Brazil
2100-0130z on 6075 kHz to USA
2100-0130z on 9570 kHz to USA
2100-0130z on 9635 kHz to Venezuela
2100-0130z on 11,840 kHz to Brazil
2100-2300z on 9600 kHz to Brazil
2315-0130z on 9555 kHz to Brazil
Saturdays and Sundays:
0600-1900z on 6130 kHz to Europe
0600-1900z on 9780 kHz to Europe
0600-1600z on 17,685 kHz to Africa
0600-0800z on 17,595 kHz to Timor
0700-0830z on 9615 kHz to Europe
1100-1900z on 15,200 kHz to USA
1100-0900z 17,745 kHz to Venezuela
1400-1700z on 21,515 kHz to India
1600-1900z on 15,515 kHz to Africa
2100-2300z on 9600 kHz to Brazil
2100-0200z on 6075 kHz to USA
2100-0200z on 9570 kHz to USA
2100-0200z on 9635 kHz to Venezuela
2100-0200z on 11,840 kHz to Brazil
This information from Andreas Volk of ADDX (Germany).

WINB missing

Reporting to **World of Radio**, George Thurman advises that US private station **WINB** is currently off air due to technical difficulties, a situation that has been the case for some weeks now. A return for the controversial broadcaster is possible during September, but the end of 1995 has also been mentioned as a realistic target date.

WINB has gained notoriety in some circles for carrying paid programming by ultra right-wing groups and individuals, as well as some less-than-conventional fundamentalist preachers.

Continued from Page 61

(Has freeware contest logging software for the IOTA contest and other RSGB contests. Also available by anonymous ftp from: ftp.iol.ie /users/okanep)

Goddard Amateur Radio Club, Inc. (WA3NAN):
http://macgwy-mac2.gsfc.nasa.gov/garc/wa3nan-home-page.html

Ham Radio & More Station List:
http://www.acs.oakland.edu/barc/ham-more/ham-more.html
(Information on upcoming shows, reviews of past shows, and even theme music; updated courtesy of the Boston Amateur Radio Club.)

Hams on the Internet email address listing and search engine:
http://www.acs.ncsu.edu/HamRadio/UsenetList.html

Jeff's Progressive Pages:
http://www.crl.com/~jeffj/home.html

Manchester Computing Centre:
http://www.mcc.ac.uk/OtherPages/AmateurRadio.html

Meteor Shower Calendar 1995:
http://www.cnde.iastate.edu/staff/swormley/Meteor_Showers.
(This is also available from http://user.itl.net/~equinox under the International Meteor Organisation calendar page.)

Naval Postgraduate School ARC:
http://www.sp.nps.navy.mil/npsarc/k6ly.html

N.E.W.S. Group VHF Web page:
http://www.ultranet.com/~bellvill/news.html

Newsline Amateur Radio News — a very good amateur radio newsletter:
http://www.acs.ncsu.edu/HamRadio/News.html
FTP site: oak.oakland.edu/pub/hamradio/docs/newsline

North Carolina State University amateur radio WWW main page:
http://www.acs.ncsu.edu/HamRadio
(Online satellite pass predictions, Repeater database and much more...)

North East Weak Signal Group (N.E.W.S.) VHF club:
http://www.ultranet.com/~bellvill/news.html
(VHF-UHF-SHF amateur radio information and links)

OH2BUA WWW Page:
http://www.clinet.fi/~jukka/
(DX clusters listings and solar activity announcements; mostly DC band DX)

Ohio State Usenet FAQ mirror for Ham Radio:
http://www.cis.ohio-state.edu/hypertext/faq/usenet/radio/ham-radio/top.html

PI4ZLD Holland Radioclub 'Radioclub de Bevelanden':
http://www.HZeeland.nl/~eddy/ham/rdb/index.html
or http://sys2.pe1cig.ampr.org/rdb/index.html

QSL Route Info via IK4LZH Webpage with update/insertion feature:
http://promet12.cineca.it/htlzh/qsl.html

Repeater lookup: KE4ARM's Online Repeater DataBase:
http://www.acs.ncsu.edu/scripts/HamRadio/repeaterdb

Rob's Cobweb:
http://www.ultranet.com/~bellvill/
(New England area radio information — frequencies, club info, email addresses of local amateurs, links, Web page services for sale.)

SAREX — Shuttle Amateur Radio Experiment:
http://www.nasa.gov/sarex_mainpage.html

Shortwave Radio catalog World Wide Web Page:
http://itre.uncecs.edu/radio/

ShortWave Spy Numbers Stations, Macintosh ham radio programs:
http://www.access.digex.net/~cps/

Slow Scan TV:
http://www.ultranet.com/~sstv
(Complete mini-handbook on image communications with amateur radio with sample images, history, how to get started at little or no cost, commercial product descriptions, home-brew projects, FAQ, and more.)

Solar Activity Daily Report from IPS Sydney, Australia:
http://www.ips.oz.au/rwc/

Solar Flux without the absorption predictions:
http://www.drao.nrc.ca/web/solar.shtml

Stanford Amateur Radio Club Server (W6YX):
http://w6yx.stanford.edu/w6yx.html

TAPR Packet Radio WWW site:
http://www.tapr.org/tapr
(Includes a Packet-to-Internet gateway.)

Technical University of Ilmenau:
http://server.systemtechnik.tu-ilmenau.de/ham.html

University of Arkansas at Little Rock Amateur Radio Club's Ham page:
http://www.ualr.edu/doc/hamualr/hamualr.html

University of Maryland Amateur Radio Association (W3EAX):
http://w3eax.umd.edu/w3eax.html

W2SZ Mt. Greylock VHF Contest group — RPI Amateur Radio Club:
http://rpinfo.its.rpi.edu/dept/union/w2sz/www/

YAHOO WWW URL search index for anything and everything (well, almost):
http://www.yahoo.com/
or akebono.stanford.edu/yahoo/Entertainment/Hobbies-and-Crafts/Amateur-radio

Thanks to Mike Kenny from the Bureau of Meteorology in Melbourne for finding this list for R&C. And now, here are Paul Butler's additions:

Amateur Radio's Best of 75 Net:
www.mindspring.com/~ko4ta/bestofnet.html

Colorado State amateur radio information:
www.rmsd.com/hamradio/hamradio.html

Dino's VE2DM W^3 page:
www.cam.org/~dino

EINET Galaxy amateur radio web listings:
galaxy.einet.net/galaxy/Leisure-and-Recreation/Amateur-Radio.html
Note: EINET is one of the better Internet starting points, with just about everything on offer, even things you did not know you were interested in!

N9SRW's amateur radio WWW resources:
gagme.wwa.com/~phantom/ham/ham.html
Note: this may have moved to www.wwa.com.

Texas DX Society:
pegasus.ssctr.bcm.tmc.edu/tdxs.html

Trafford Amateur Radio Club:
www.mcc.as.uk/OtherPages/TraffordARC/Trafford.html
Note: this is located on a computer at the Computer Center at Manchester University in England.

Notes: YAHOO offers a couple of alternatives. You can use the alias www.yahoo.com and follow the links through Entertainment and Hobbies and Crafts to Amateur Radio. We got an empty document, but keep trying. By the way, Yahoo is one of the best starting points on the Internet — try the FishCam, which provides pictures of a tropical aquarium updated every minute! Note also that your WWW browser software may require you to add http:// to the start of these addresses. We use Netscape, which appears to have enough 'intelligence', thank goodness, to know work out what the address means *without* the http:// bit.

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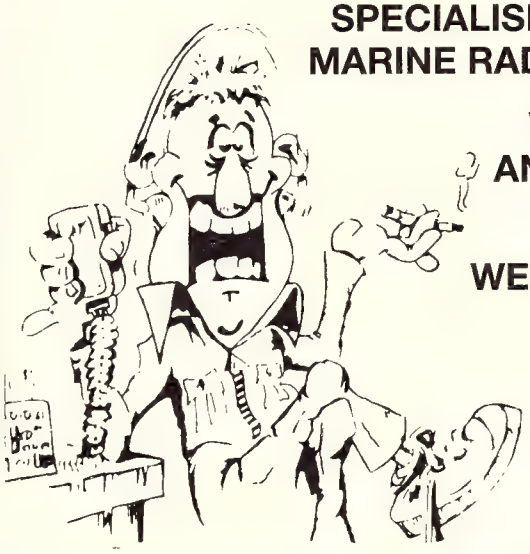

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THE INTERNET, E-MAIL AND OTHER THINGS OF GENERAL INTEEST... By Robert Williams

Baudwalking

Hi, and welcome to the world of the Internet. So far David Flynn has looked at the basics of what the Internet is all about and how it can benefit you. This time we're going to show you another very useful application that the Internet has, called **Usenet**.

We've all heard about being able to send e-mail messages to all corners of the globe, to contact friends, discuss business matters or even to write to the President of the United States, but that is on a one-to one-basis.

However there is another very important tool that is carried on the Internet which involves a form of electronic mail. What I am talking about is Usenet. Usenet is just like a giant world-wide electronic bulletin board which carries *thousands* of message areas — or, more correctly, newsgroups — on just about any subject you can think of. Yes, even sex gets a mention...

An important point to remember is that Usenet isn't Internet. The Internet is made up of several smaller networks all joined together. These networks carry different types of traffic and Usenet is but one type of traffic. There is no central organisation, or controlling body, just voluntary guidelines and luck. Usenet allows thousands of people daily to discuss issues important to them with people of similar interests.

Usenet started back in 1979, after the release of version seven of Unix with UUCP, when Tom Truscott and Jim Ellis in North Carolina thought about hooking up two computers together. With simple crude software written for the purpose the first signs of Usenet were born. Information and ideas could be electronically transferred between Unix computers with replies coming back just as quickly. By just sending one message it could automatically be sent to everybody concerned.

Today thousands of messages traverse the globe filling up newsgroups, a good indication of how popular the service is.

Usenet has so many interesting newsgroups that you can spent your entire day, in fact your entire week, reading messages people posted and still not scratch the surface. My Internet provider currently carries 12,210 various newsgroups.

This figure varies, as not all Internet providers carry all newsgroups, due to space limitations, censorship reasons, and the like. But the majority of people who venture into Usenet are satisfied by the array of newsgroups that their local Internet provider carries. If there is one particular news group that your provider doesn't have and you want it, just speak to them and see if they will carry it for you.

So what subjects are covered? As mentioned earlier, just about everything you can imagine is discussed. From animals to Zebrafish (whatever *they* are!), amateur radio, computers, science, archaeology, favorite TV programs, aviation, scanning and shortwave radio... the list goes on and on. If you can't find a news group on a subject that takes your interest, you can even try to start one. I'll mention more on that later on.

Don't always believe what is said...

Because Usenet covers such a broad range of topics, including the more sleazy ones, the mass media likes to pick up on the fact showing how dangerous the Internet can be without pointing out that it only represents a very small slice of Usenet and Internet activity.

Time Magazine recently covered pornography on Usenet, and was heavily criticised by professional people who use the Internet constantly, for their poor research and for failing to verify their sources.

But like anything in the community that isn't supervised, you can get the undesirables lurking in the shadows of cyberspace.

Newsgroup structure

Generally newsgroups are set up hierarchically so its easy to find your way around. Some of the common newsgroups have names starting as follows:

alt These are controversial or unusual topics
rec Hobbies or recreational newsgroups
misc Miscellaneous newsgroups
news Newsgroups about Usenet itself
sci Science, except biology
talk Politics and other common topics
biz Business topics
comp Computer-related newsgroups

So, for example, under **rec.radio** you can have newsgroups like **rec.radio.amateur**, **rec.radio.amateur.digital.misc**, **rec.radio.shortwave** and **rec.radio.broadcasting**. From their names and their structure it's easy to determine what these newsgroups are all about.

How does Usenet work?

As I said earlier, Usenet works like an electronic bulletin board, by accessing a news group that takes your fancy and using a news reader, which you can run on your PC, Mac, or on your Internet provider's machine.

When you access the newsgroup you will be presented with all the current messages displayed by subject and, by choosing one of these messages, you can then open it up and read it. Then you can close the message or reply to it or even send a message of your own.

Once the message is sent it is then transmitted to every Internet machine in the world that carries Usenet news and that particular news group. That's quite something to consider... In a matter of minutes your message is being routed around the world through the massive maze of data lines. It's that simple.

Depending on the software you use to read news groups, the messages can be displayed in one of two ways. Probably the most common is by *threads*. This means that messages that relate to the same subject are grouped together. And the other way is by *time*, as they arrive on the machine.

Popular newsgroups receive in excess of a 100 messages a day, while others could go for days without receiving one. So, because of the vast number of newsgroups and the huge number of messages that Usenet generates, Internet providers restrict the number of messages each newsgroup retains.

Some newsgroups are moderated, too — that is, material that is posted to the newsgroup is automatically sent to a 'moderator', whose job is to screen all comments before re-posting it to the newsgroup, for everyone to read.

Some of the popular newsgroups also have repositories

where items are stored for future reference. These messages can be retrieved either via using File Transfer Protocol (FTP) to the site, or through a mail message to a computer which interprets your request and sends back the details of what is stored on site.

Access to these various services is via a network of gateways, which pass you between Usenet and the mailing lists. I don't want to talk about mailing lists here too much — they will be covered in another article — but I would add that many organisations have access to e-mail facilities, but don't subscribe to Usenet. So someone came up with a clever idea to mirror selected Usenet newsgroups using e-mail and automatically send material to and from newsgroups. That way even more people can join in the discussions. A good example of this happens with my favorite news group, rec.radio.shortwave.

In the US there is a **listserver**, an automatic process running on a computer, which allows you to subscribe to mailing lists. Every time someone posts a note in the shortwave newsgroup, in my case, it gets re-posted to all those who have 'subscribed'.

And if I wish to send a note I send an e-mail message to a certain address on the listserver and it re-posts it to rec.radio.shortwave. This is called a two-way gateway. Gateways can also be one-way, ie: they only send mail in one direction.

Usenet etiquette

People who frequent Usenet like to think of themselves as being a part of a community, a community in cyberspace. And like every community there are rules to live by. If you start criticising someone who's a popular figure or is highly regarded on the newsgroup, or attack their beliefs, expect to be 'shot down or, as they say, 'flamed'.

If you sat with a group of your friends and started picking faults with one of them, you could be attacked yourself or asked to leave. And that is exactly what could happen on Usenet. People who continually refuse to abide by the community's rules can have their privileges taken away from them.

In cyberspace it is possible for an Internet provider to remove your access to Usenet if they receive complaints that you are abusing fellow users or aren't following the rules that others had established. There are newsgroups that have been specially set up for 'flaming', a sort of pressure valve for people to go to.

Advertising is another sore point. People *pay* to access the Internet, and hence Usenet, and don't really want to have to sift through messages advertising some strange new product that may not even be available here in Australia.

However, there *is* room for advertising, in the appropriate places. Some commercial advertising is accepted and even private sales have a newsgroup. Another thing to be wary of is 'test' messages. Say, for instance, you've sent up your PC and want to be sure that you are getting through, so you send a message to the outside world to test it.

Do this too often and you'll get shot down in flames. If you want to test your machine, go to the right newsgroup and do it there. This way you won't upset 'the community'.

When writing to a newsgroup about what someone else has said, quote a *small* segment of their original comments, just enough for others to pick up what you are writing about. That way others will read what you have said. If there is a long quote about what someone else has said they are less likely to take an interest in what you have written.

Cross-posting — putting the same message in more than one newsgroup at a time, can also be a problem. Avoid doing this unless it is absolutely relevant to the group you are posting to it. Newsgroups can be local, national or international in flavor, so keep this in mind when posting details to your favorite news group.

Are people really interested in learning about your local two metre repeater or what UHF frequency your Piazza hut delivery van is on? For us here in Australia look for newsgroups starting with **aus**. These are Australian-flavored newsgroups.

And one more thing to remember: before you rush in and start writing your own prose, sit back and watch others. It pays to learn how to do things right. That way there is less chance of you putting your foot in your mouth.

By careful about copyright, too. Just because it has been put in a newsgroup and spread around the world, don't assume that it's not copyright. (In fact, in this country and many others, *anything* you write is subject to copyright provisions, whether or not you have put a copyright notice with the work. Everything which appears in this magazine, for example, is copyright to the people who wrote the material. If you wish to reprint something you've seen on the Internet, perhaps in your local radio club newsletter, you would need to write to the message's owner (its originator) to formally seek permission.)

To learn more about Usenet etiquette get a copy of Emily postnews guide to 'netiquette'. Its location is shown in the accompanying table.

How to get started, and where to go

There is a wealth of information out there, but the hardest thing is knowing where to go to *find* it.

If you're on-line via an Internet provider and paying for the privilege, you don't want to spent too much time on-line. You want to go directly to the best source of information and read or download it. So here are some important tips that will make life easier for you.

Many newsgroups produce what are called **FAQ**s, which is short for **Frequently Asked Questions**. This can be a comprehensive list of common questions people ask when joining the group or information about where to go to learn more about the subject.

Look for the latest FAQ in your favorite news group. They are generally posted each month, or whenever an update is made to the previous one. It is also accepted practice to post the FAQs for all newsgroups in **news.answers**. This newsgroup is worth checking regularly.

You might also like to drop by **news.lists**. Here you'll find details on mailing lists, as well as breakdowns on Usenet traffic measurements.

Newcomers should also check out **news.announce.newusers**, as the name implies. It's a 'first port of call' for people venturing into Usenet-land. If you're technically-minded and want to learn more about how Usenet works, then look out for RFC 1036 and 977.

RFCs are **Requests for Comments** and exist for just about every aspect of how the Internet and its tools work. They can be dry reading, but you can get a good background. RFCs are stored on various sites around the world, and may even be stored on your local Internet site.

Creation of a new newsgroup

Another port of call should be **news.group**, which is actually a very important group. Sometimes people get frustrated with their newsgroup because it doesn't meet their needs, or they feel that there should be room to discuss near-relevant topics without being flamed. So after raising some discussion in the group about setting up another news group or perhaps creating an alternative group on a slightly different topic, you can then start a discussion in news.group about creating *your* new news group.

People produce a **RFD** (**Request For Discussion**), **CFD** (**Call For Discussion**) to promote the idea among the

newsgroup. After a mandatory period of discussion (and after it has been decided whether to have the new group moderated or not), a **CFV** (**Call For Voting**) takes place.

The CFV needs to have precise details on voting conditions and how to vote. The voting period needs to last between 21 and 31 days. After voting and results have been posted to **news.announce.newgroups** a five-day waiting period takes place to check for any obvious mistakes.

For the group to be formed there needs to be a 100 vote margin or two-thirds percentage vote in favor. If the vote doesn't get up you can try again in six months time, going through the whole process over again.

So now you can see why there are so many newsgroups. Just like in our society, except it involves people from around the world... in triplicate.

Reading Usenet

There are several ways to read Usenet news. If you subscribe to a Internet provider which is running Unix, then it is very likely to have a 'newsreader' online. Some of these news readers aren't user friendly and take a lot of patience to move around between newsgroups and the news.

If you have access via a **SLIP** (**Serial Line Interface Protocol**) or **PPP** (**Point To Point Protocol**) link you can run Netscape or a similar web browser which can read news.

Netscape presents news in thread mode and is very easy to drive. There are several shareware news readers available that will run under windows, with *trumpet winsock*, or similar winsock-compliant software. There are several commercial packages being released as the demand to connect to Internet expands.

Internet In A Box and **Air Series** are just two of many available. These two contain many of the Internet tools you need to navigate around. The air newsreader is good and is very flexible. As the newsgroups can contain many hundreds of messages some newsreaders allow you to tag the messages you read, so when you next drop in you don't have to read ones you've previously read.

Another useful tool is built-in to some news readers is a **killfile**. These are lists of words that the newsreader looks for in your newsgroups. If it finds any of them it doesn't display that message — a sort of filter process for news. (A pity it doesn't work on the telly.)

Other Usenet tools

While space limitations restrict me on how much I can explain to you here, there are some very interesting Usenet tools available to Internet users.

- **Usenet via e-mail**: For those who don't have direct access to Usenet.
- **Key word searches** through Usenet newsgroups: At Stanford University they have a **netnews** filtering service — a tool which allows you to do a key word search of the Usenet newsgroups for keywords. This is very handy if you are doing research and you don't have time to read all the newsgroups. You can even subscribe to a service which will post you a daily listing of newsgroup mail based on your keyword search.
- **Anon server**: If, for some strange reason, you want to post anonymously to a newsgroup, this service will do it for you.

As you learn about Usenet, you'll see why it's such a powerful tool. It's going to become even more popular as more and more learn about the Internet and become 'net-aware'.

We'll have another dose for you next time. Have fun until then. In the meantime, you can e-mail me at the following address: rwilliam@tmn.telecom.com.au

The quick guide to important Usenet news groups

While I certainly can't mention all the relevant newsgroups that are available, I will try to mention a few which I think are important. The best way to find out what is available is to search through all the newsgroups yourself or get a copy of active newsgroups from **news.groups**.

news.announce.newusers

Look for the following articles here:

- A primer on how to work with the Internet community
- Answers to FAQ about Usenet
- Rules for posting to Usenet
- A guide to social newsgroups and mailing lists
- Hints on writing styles for Usenet
- What is Usenet
- What is Usenet — a second opinion
- Copyright myths FAQ
- Netiquette

news.newusers.questions

Only one important item to look for here:

- How to find the right place to post — FAQ

news.groups

- Plenty of RFDs here. As I type, a debate is going on about reorganising the **comp.newsgroups**.
- Get a copy of List of active newsgroups, parts one and two.

news.lists

- Get a copy of the publicly-accessible mailing lists. There are 14 parts to this list...
- The **List of Periodic Information** tells you about Usenet newsgroups. This contains 15 parts.
- Usenet readership summary — done monthly
- **Top 40 newsgroups**. This is given in several ways, so take your pick.
- Usenet flow analysis

news.answers

- Usenet-moderated **newsgroup archive list**. This lists details on places to go for archived Usenet material.
- FAQs

Usenet newsgroups of Interest

Amateur Radio

rec.radio.amateur.antenna
rec.radio.amateur.digital.misc
rec.radio.amateur.equipment
rec.radio.amateur.homebrew
re.radio.amateur.misc
rec.radio.amateur.packet
rec.radio.amateur.policy
rec.radio.amateur.space
uk.radio.amateur

Radio

alt.internet.talk-radio
alt.internet.talk.radio
alt.radio.digital
alt.radio.internet
alt.radio.pirate
alt.radio.talk

continued on page 95

What you need to know about

IMPORTING RADIO EQUIPMENT

By Greg Towells

Many readers will have had the opportunity to peruse a copy of an overseas radio or computer magazine (whilst awaiting the next edition of R&C, of course) and wondered about the prices of radio and computer equipment in the overseas market. In many instances, the cost of the same or equivalent equipment will seem lower than that available here in Australia, even after the conversion from the foreign currency to the local stuff.

Maybe the mystery of importing equipment privately has deterred some from buying from overseas sources, however if the temptation to import a radio that seems heaps cheaper overseas than here is about to bite, then read this lot first.

There is nothing hard about the actual ordering of overseas equipment — just confirm the cost of the goods and shipping charge, send a letter to order the equipment (or email with your Visa number) and enclose a bank cheque in the currency of the originating country.

Firstly, this article is not intended to be a buyer's guide as to what to buy, or where to shop. Mainly, we are advising what to be aware of before committing funds overseas in a bid to procure that gear cheaper than you might in Australia.

Naturally, the most obvious comparison must be made after the currency is converted to Australian dollars, and be sure to find out what shipping will cost in Australian dollars also. You must also consider if the lack of an Australian warranty is worth the saving you might achieve. If all still looks good, be prepared for more.

You should be aware that some types of radio gear are not worth the hassle to import into Australia. 27 MHz CB radios are *not* a good idea to try to import, as you will have to prove to Customs here that the radio is type-approved by the SMA. If it does not have an Australian type-approval number marked on the radio, then Customs will hold the unit until you can prove it is type-approved, or alternatively it will be sent to SMA for type-approval, and this process will cost you hundreds of dollars!

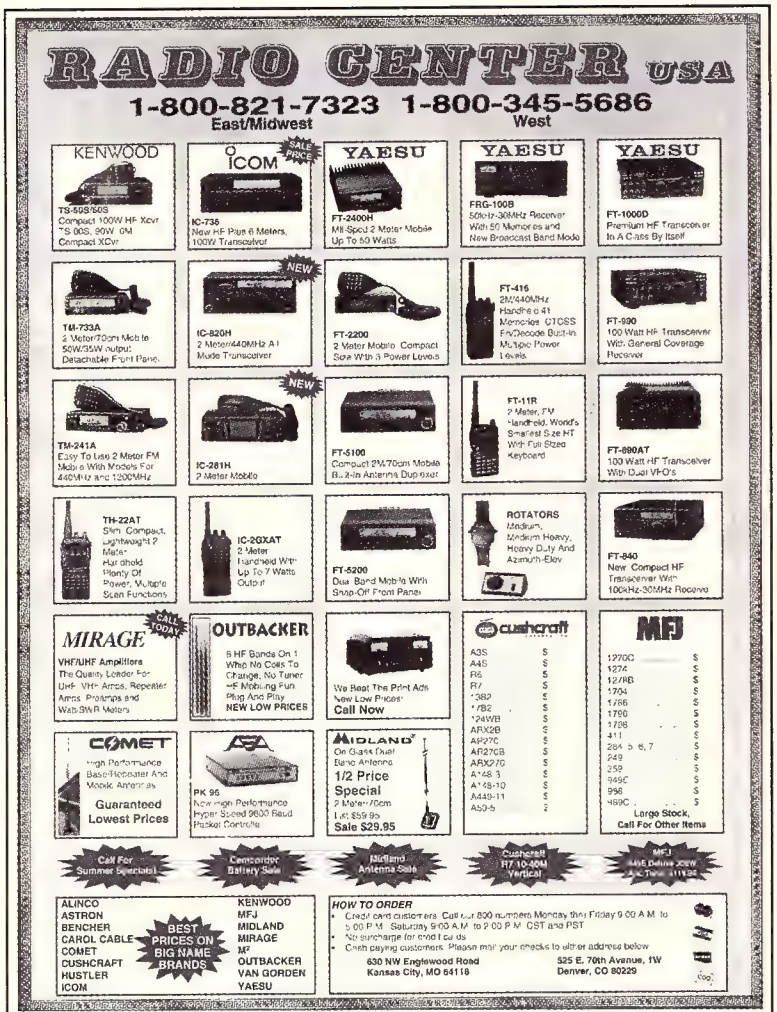
Do not even bother importing a cordless phone into Australia. While there is a small list of type-approved cordless phones, most will be held by Customs for type-approval by Austel and SMA. Austel's type-approval procedure is a snip at $4500, while the SMA charges a modest $1400. You'd have to agree that it's probably not worth it for one lousy cordless phone...

It's also generally not worth importing amateur transceivers either. For starters, very few overseas markets have radios with the same band data stored inside, and it's often a case of having to change the CPU to get a seemingly-identical radio to perform correctly. A couple of good examples are JA and Europe, which have a 2MHz-wide two metre band. The USA's 70cm band sees almost all its radios unable to transmit on our 70cm band. JA radios, meanwhile, have exact band edges programmed in by law, and that includes HF too, where its bands are a long way from ours. It gets worse, too... If you really must import amateur gear, *do* be careful!

Okay, let's say you've decided to purchase a scanner from a company in the USA, for example. You'd have to be on a safe bet there, wouldn't you? Well, no. US law prohibits the sale of scanners with coverage of the cellular phone band and frequencies near that area, so it is likely that any scanner purchased from a store in the USA will not have coverage of the 800 MHz band. But let's say you decide to go ahead anyway.

Once you manage to land your scanner, you will have to figure out how to modify the radio back for coverage of 800 MHz if you want that part of the spectrum, and you'll probably have to find a power supply for it, since — if it has one at all — it will doubtless come with one suitable for the US standard 117 volt AC system.

If you manage to mangle the US power plug enough to force your new radio's plug into our 240 volt socket, you will release the inbuilt smoke real quick. (No, that won't do it much good.)



The idea of importing equipment — radios, antennas, accessories and the like — sounds great in theory, but by the time you pay the freight and customs fees you can usually buy it cheaper in Australia, and save yourself a lot of hassles.

However, we're ahead of ourselves — first you have to land the unit *then* you can blow it up!

Once you have ordered the radio from the supplier, you have to wait until it arrives in Australia. When it gets here, you will receive a notice from your local Post Office (that's if it was posted, of course) for payment of duty and sales tax applicable in the case of a radio receiver.

That's right, even after paying for the radio and shipping, you are still up for import duty — and, would you believe, sales tax, even though you bought it overseas. Wait, it gets worse. (Is the radio *still* cheaper than buying local!??)

The duty for a scanner is around 14 per cent and sales tax is 21 per cent. I'll work out an example for you. Let's say your scanner cost US$200 (a pretty modest one, in other words).

First we convert that to Australian dollars, and at around 72 US cents to the Australian dollar at present that works out to AUD$277.78 (where AUD is Australian currency).

Now, for Customs purposes, the radio is worth AUD$277.78, but the cost of shipping has not been included in these calculations. Our import duty is 14 per cent of $277.78 — $38.89 — which is added to the cost of the radio, which means its value now is $316.67.

That value is now 'uplifted' by 20 per cent, which increases its value to $380.00. The 'uplift' is applied to supposedly equalise the cost of imports with locally-made goods, whether or not that type of goods is made locally. It's starting to sound pretty dear... but wait!!

Now we add the sales tax of a very modest 21 per cent.

This is calculated on our $380.00, which comes out at another $79.80. So the total import duty and sales tax payable by you before you can get your radio from the post office is $118.69. That means that your radio has cost $435.36 before shipping, rather than US$200 plus shipping, in this example. (No, we haven't yet added into the equation what we paid for the cost of posting it from the US to Australia in the first place!)

The above example is calculated if you import by post. If you personally fly overseas and bring back that same radio, then you get some valuable passenger concessions. This presently amounts to $400 duty free, plus alcohol and tobacco concessions, per adult. So if your import is worth less than $400, then you do not pay any import duty or sales tax at all on it when you carry it in personally. However, if you have more than $400 worth of duty-free goods — which includes things like cameras and the like — then you pay tax on everything over that $400 limit. There are no such concessions available when purchasing goods from overseas through the post.

By the way, if your purchase mailed into Australia is worth more than $1000, its importation will have to be handled by an authorised Customs agent, and you'd better believe they slug you for the privilege!

You see, the agent charges a proportional (percentage-based) fee to handle all of the paperwork on your behalf, and this can be quite a hefty impost on a small item, as the agents charge a solid minimum fee. By the way, if your purchase is sent to Australia by international air freight, rather than just through the post office, an import of ANY value will have to be cleared through Customs by an agent. You cannot simply turn up at the airport and ask for your parcel. It doesn't work that way. Duty and sales tax payable varies depending on the types of goods imported.

Computer equipment is another popular import by private persons, and is rated Ø per cent duty (that's right, *nil* duty), but it has a 21 per cent sales tax impost. The calculation is worked out the same as above: uplift the Australian dollar figure by 20 per cent, then work out the sales tax payable.

After you work it all out, you will probably find that it is far cheaper to buy high cost radio and computer equipment locally, rather than import it from overseas.

When you buy locally, you should get a decent warranty and a local dealer to take it back to when things go wrong. It's a bit hard to do that if you bought it from overseas...

You can also get to see the goods in action before you buy — don't forget that flashy advertisements can often make a mediocre radio look great. In all, then, beware...

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Morse Code Pack	$11.50	☐	100 Projects	$5	☐
1000 Questions	$5.50	☐	500 Questions	$5	☐

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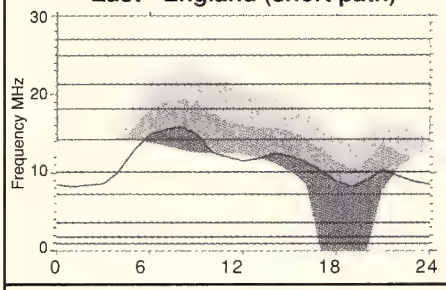
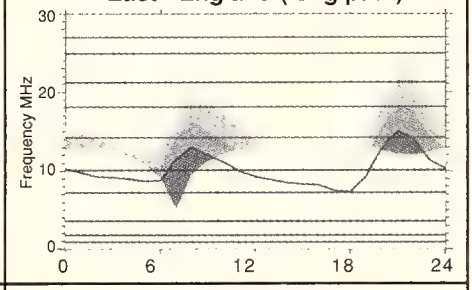




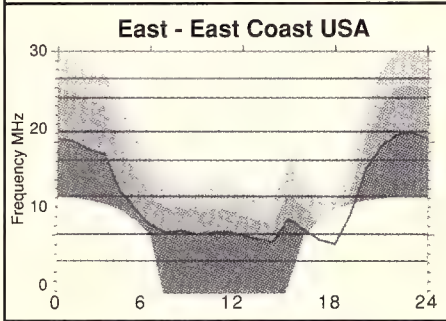
ABOUT THESE CHARTS

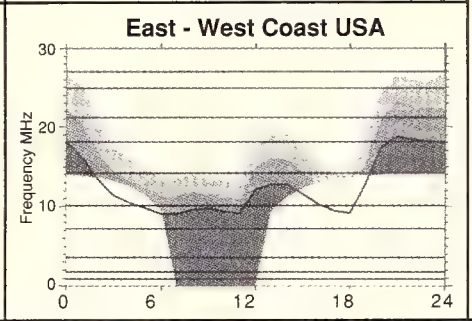
The data on these pages are graphs showing forecasts for expected HF operating conditions between Australia and a number of important DX destinations. The information they contain is prepared by **IPS Radio and Space Services**, a division of the federal Department of Administration Services. IPS monitors changing radio conditions — which are affected most greatly by fairly predictable changes in solar activity — and issues reports and warnings based on that data.

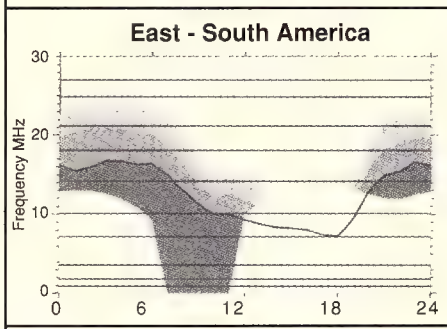
Stations in the eastern half of Australia should refer to graphs on the left hand page. The data on the right hand page is calculated for stations in the western half of the continent. Of course, if your location is in the middle of the continent try reading them *both*... then make an educated guess.

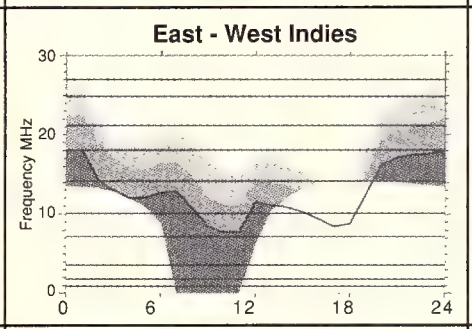
The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time or UTC ('z'). The vertical axis shows the entire HF spectrum with a horizontal line representing each HF amateur band.

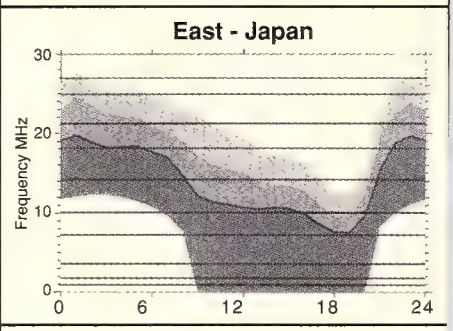
The maps are easy to read. First go to the map which looks closest to the area in which you are interested. Look *up* from the time and *across* from the frequency to the point at which the two variables merge. Note which grey scale — if any — appears at the intersection of the particular time and frequency combination for that area and refer to the legend (right) to find the sort of propagation most likely to apply. If the space is blank the forecast is not good — your time and frequency combination is unlikely to allow communication to the destination station.

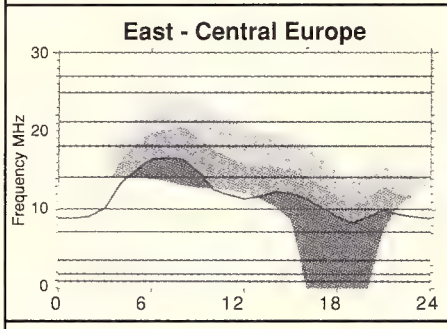


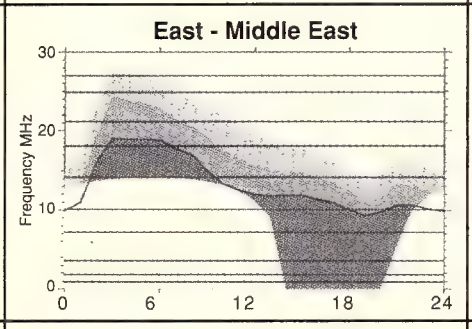


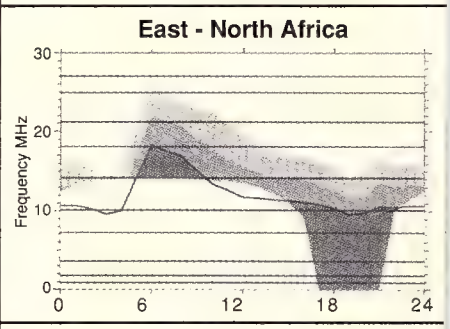


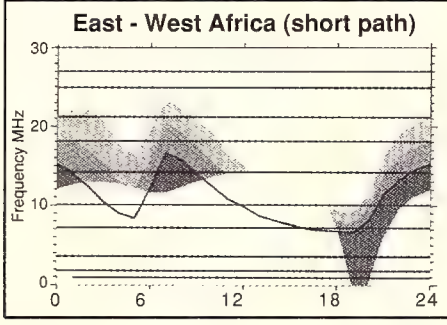


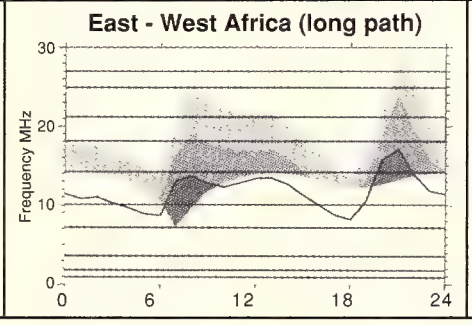


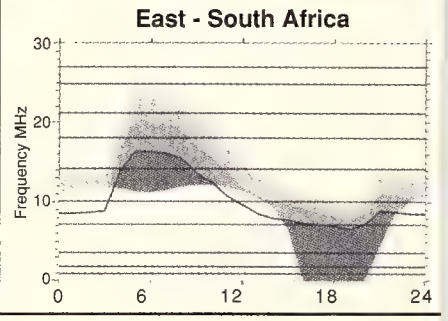












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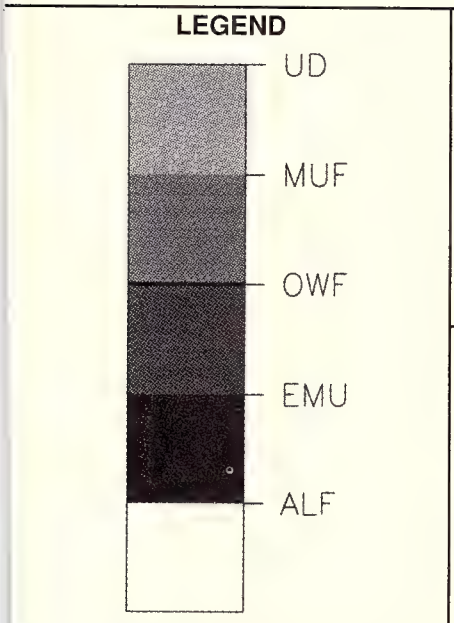
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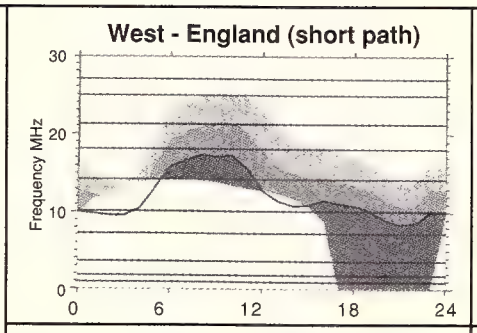
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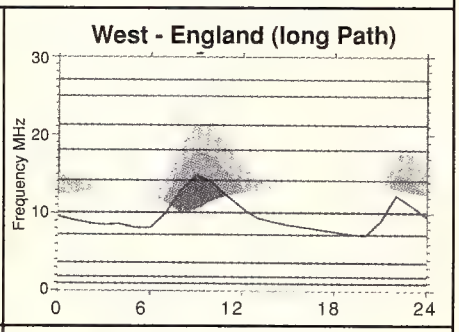
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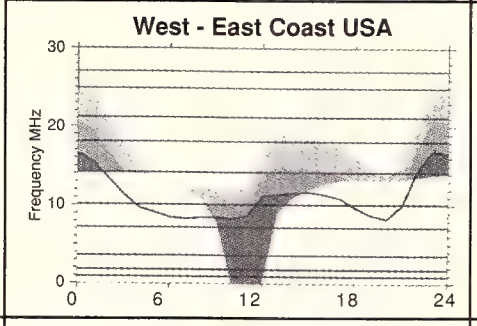
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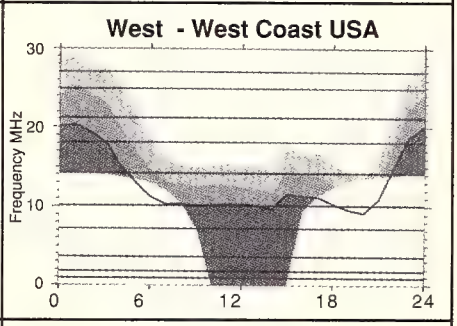
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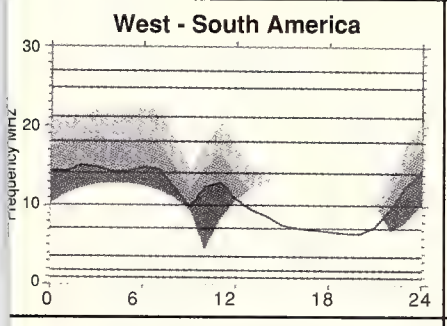
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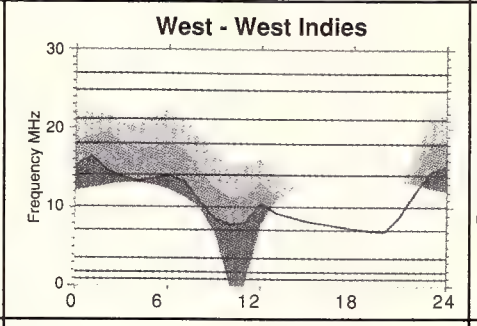
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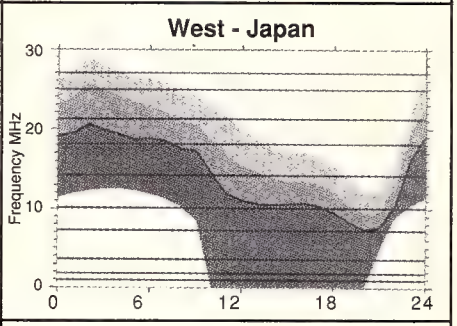
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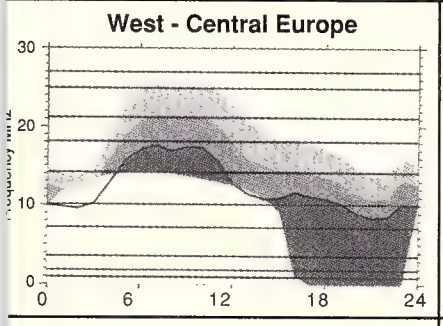
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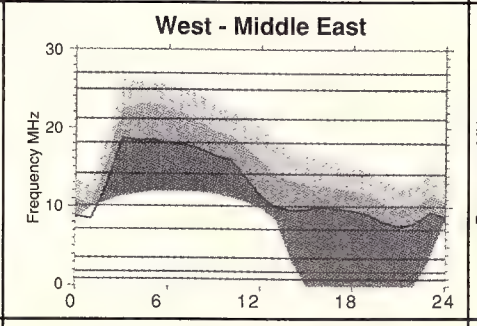
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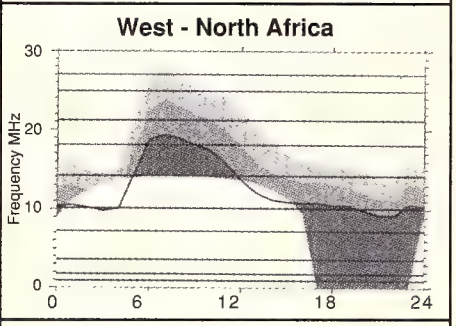
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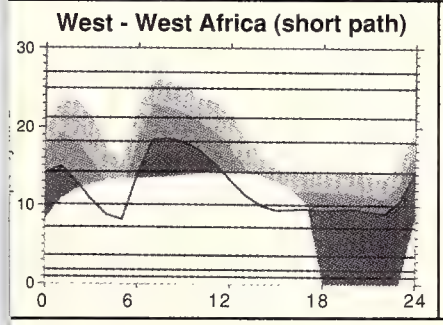
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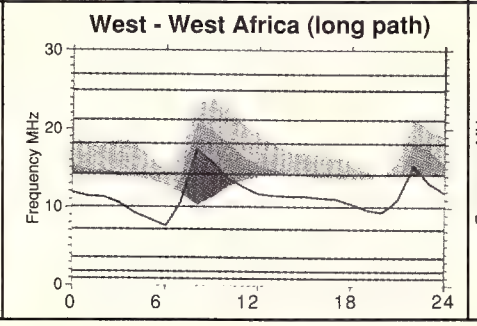
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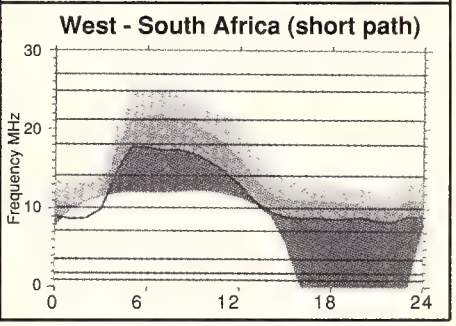
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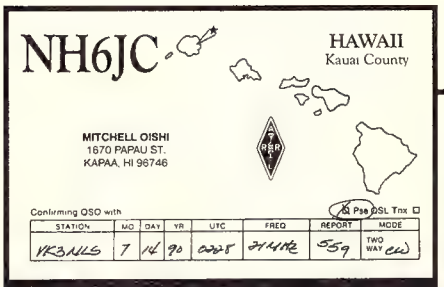
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HAWAII
Kauai County
MITCHELL OISHI
1670 PAPAU ST.
KAPAA, HI 96746
Confirming QSO with
Pse QSL Thx
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VK3ALS | 7 | 16 | 90 | 0225 | 21MHz | 559 | TWO WAY CW

DX UPDATE
WHAT'S HAPPENING OUT THERE?

The following information was obtained from a number of sources, including the Shortwave Possums BBS with on-board credit to OPDX/BARF80 (Ohio/Penn DX Bulletin) with thanks to the ARRL, Northern Ohio Amateur Radio Society, Northern Ohio DX Association, Ohio/Penn PacketCluster Network, K4CEF & South-eastern Cluster Group, DJ5JH, DJOWO GOGWA, Z32GX, KN4F, AH6MM, KQ8M, KB8NW, KL7a and WB9OTX. It has been edited to omit specific USA-only interest. R&C wants to supply the best DX information available (as we believe we already do, thanks to Jim Smith, VK9NS!). We welcome regular input from VK and ZL stations, particularly from net controllers on a basis of heard/worked. Please FAX Len Shaw, VK3ALS on (03) 9775 2575 (during business hours) to have your info included in this section.

Scarborough decision

At its July 19 meeting, the ARRL Membership Services Committee (MSC) of the ARRL Board of Directors voted to remove from the Awards Committee Standard Operating Procedure (SOP) an administrative interpretation of a Board motion.

The deleted text said in part:

"Thus it requires a favorable recommendation by the DXAC to initiate a country status review by the Awards Committee."

All ARRL Directors were present at the meeting, and it was the sense of the meeting that the Awards Committee should review negative as well as positive country status recommendations of the DXAC. On July 25, the ARRL Awards Committee voted unanimously that Scarborough Shoal (Huang Yan Dao) should be added to the DXCC List under Point 2 (a) of the Countries List Criteria. Committee members all felt that Scarborough meets the rules that were in place when the petition for new country status was received. Finally, it is more than 225 miles from the nearest part (island) of China.

Awards Committee Chair, Chuck Hutchinson, K8CH, shared the results with DXAC Chair, Garth Hamilton, VE3HO, immediately after the vote. As announced in a June 30, 1995 news release, the DXAC voted nine to seven against recommending the addition of Scarborough to the DXCC Countries List. Under procedures established by the ARRL Board, and because the chairs are unable to affect a compromise, there is an automatic appeal. In the next step, the two committees will report the reasons for their votes to the MSC for recommendation to the full Board, which ultimately will decide the matter.

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TJ Cameroon

Jim, TJ1JB, will be taking his station down during mid-late August and returning to the US. Cards have been ordered, but Jim probably won't answer them until he returns stateside.

New IRC rates in the US

Effective July 9, 1995, the selling price for US-issued coupons is $1.05, while the redemption price for foreign-issued coupons is $0.60.

QRP DXpedition

Stefan, DL1FDF, will be active as VY1QRP, from July 24 until October 16. He will be travelling through Canada: Ontario VE3/, Manitoba VE4/, Saskatchewan VE5/, Alberta VE6/, British Columbia VE7/, Northwest Territories VE8/VY1QRP and, last but not least, from the Yukon Territory as VY1QRP/p. Look for him around 0500z on 14,060 or 14,285 kHz. Also check the QRP frequencies on: 80m (3560 or 3690 kHz), 40m (7030 or 7090 kHz) and 20m (14,060 or 14,285 kHz)

SØ Western Sahara

Tim, KCØPA, continues to remain active from here as 4U/KCØPA. He was reported recently on 30m CW. His CW is very slow, but he is giving it a try. He was also heard on 18,137 kHz 1325z. Tim will be going QRT from SØ sometime during August.

TY Benin

Ken, WA4OBO (ex-TT8OBO) has plans to stay in Benin several times during the next two years and will then become active as TY8OBO. It has also been reported that Ken has applied for a licence to operate from Ethiopia. This operation is planned to take place in August or September. Ken operates mostly in SSB on the HF bands. QSL via home call.

V5 Namibia

Charlie, KYØA (Rocky Mountain DXAC) will be active from here the first part of August from Luderitz. He says he will be operating in other places in Namibia but not as heavy as his Luderitz operation.

Charlie will be signing either V52/ZS6YG or V52YG. He will operate on CW only on 160, 80, 40 and 30 metres. There is the possibility of some 17 or 12 metre activity. This depends on his business trip activities.

Charlie adds that after his V5 activity (during September) he will be active as ZS6YG and will operate from various areas within South Africa (CW only). There is the possibility he could also be active from A22-land, but he does not have a licence, nor has he applied for one yet.

ET Ethiopia

ET3AA frequents 14,224 kHz around 0200z. QSL via PO Box 60258, Addis Ababa. On CW, look for ET3YU at the low end of 20 metres around 2230z. QSL via YU1FW.

5A Libya

Toly, UT3UY, and friends have been active as 5A1A. Most of the reports indicate that they have been active mainly on 20 metres SSB. Check around 14,202 kHz between 2230 and 0230z. There were also reports on 21,020 kHz at 1715z and 28,015 kHz at 2035z.

OD Lebanon

OK1EE/OD5 has been active on the bands mainly on CW. He has been heard on 14,010 and 7003 kHz between 0200 and 0300z.

A9 Bahrain

Adam, A92MM, has been active on 20 metres SSB. QSL him at Box 116, Manama, Bahrain.

YB Indonesia

Jack, YB2ARW, is active weekends on 17 and 20 metres around 0700z. He is also QRV daily on 20 metres around 1200z.

Saudi Arabia

Mike, K3UOC, arrived back in the States earlier this month. Mike made 32,332 contacts between October 11, 1994 and July 6, 1995. 97 per cent of the QSOs were on CW, the remainder on SSB.

He plans to return to the Middle East on September 14 and will reactivate 7Z5OO. The licensee of 7Z5OO is His Royal Highness Prince Khaled Bin Sultan Bin Abdulaziz Al Saud. The station is located at the Prince's Palace in Riyadh. Mike will be active on 160 through 10 metres and will bring six metre gear with him in the hope of his VHF operating application being approved by the Saudi PTT. QSL via W1AF.

Monaco

Laura, 3A2MD, is active almost daily on 14,250 kHz ±QRM at 2100z, and sometimes joins the DX net on that frequency and time.

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J OB.01

ACBRO Inc. NEWS

ACBRO's mail sometimes brings in an item requesting information on starting up a CB club. This invariably raises the issue that there appears to be no ground rules for this, so we do it by applying logic and a little common sense.

The following handy hints will help those contemplating starting a club, but shouldn't really be considered the hard and fast ground rules for such enterprise.

So where and how does it start? Maybe two or three operators on the band, who may very well be new chums, decide to continue their communications face to face. As their on-air 'clubs' become dominant on the frequencies in their area, they'll eventually decide to meet on a regular basis, and a formal club will be created.

Now, most people have had some exposure to committee activity in other organisations, and realise there needs to be some sort of a 'top cocky'. Invariably the creator of the scheme will feel that it is appropriate then that he/she shall become such and they will look to having the title of President. Others who have agreed that the idea of setting up a club is warranted will probably seek some other title to maintain importance — but from here, where do you go? Perhaps it's time to put it in writing...

In writing a constitution, the objects of your club should be clearly defined. Without this, your club's future may be doomed. So now, you have a small group of people with common interests, you've set out your objects and aims in writing, and it's now that the 'hierarchy' should be established.

If you need to, you can even pick straws for the position of President, but your Secretary should be chosen, based on the experience of the potential candidates in this sort of job. It is most important that this position is filled by one who is willing to put in a bit of time, because the Secretary will end up with most of the work. Many clubs fail simply because they did not have an appropriate and effective secretary.

While the President and Secretary are invariably the mainstays of people organisations, subject to the size of the group, some others will need to be elected or delegated to other positions to form a committee. As to how many, you'll need to decide that at the time.

If the group grows — as is often the case — it is not unreasonable to think that more office bearers will be required. These could be, for instance, Vice-President, Assistant Secretary, Treasurer, Public Relations Officer, Publicity Officer, Membership Officer, to name a few, who in turn need to be supported by a committee of so many members. But in the initial instance your group may start with the two major principals, the President and the Secretary and, if the numbers of members are small, they could serve to be the committee.

Once you have this infrastructure in place, where should you turn next?

Possibly at your first official meeting it would be appropriate to endorse any preliminary arrangements that have been made then, to secure and promote your future, perhaps some ground-rules should be established.

Your first meeting will also need to establish the frequency of your meetings and other such matters. Most importantly, you will have to establish if any money is going to be involved. If so, and it probably will be, as some form of financial subscription will be considered appropriate, then a Treasurer should be appointed.

Okay, you've done it. You have established a basic radio club. Presumably you have also given it a formal name, but if you haven't yet got that far, our advice is keep it short!

So now you continue talking on your rigs, but now with the exclusivity of being the 'Mickey Mouse #1' or whatever. This may provide you with the appropriate contentment that your foundations are laid, and that little more needs to be done. And this may well be the case.

If your 'on air' conduct is found to be exemplary, the attention of others may well be shown, and they may indicate a desire to become one of your group. With pride you will accept a new member, and appropriately initiate him/her into the

group. A trial period before the membership is accepted may be part of your rules, but be careful that strict insistence on this prerequisite doesn't offend. After all, you may create an enemy instead of a member! And who needs an enemy on CB radio?

But if you win one or more new members, the handling of them needs to be done with kid gloves and diplomacy, because poor handling of newcomers may also be the making or the breaking of your club. Only experience in operating on the bands will guide you in the right direction to be taken in this regard, but to ignore some of the troublemakers will assist your survival!

You may decide to have QSL cards printed, Tee Shirts made with the club logo on them or whatever. All of this introduces more administration and, more importantly, more money changing hands. Systems are now important to keep this matter under control, which can only be established with good office bearers. You may see fit to publish a small newsletter for your members, needing still *more* money changing hands and added responsibilities. Before entering into this stage, make sure that you can continue the commitment of your publication, because one of the first signs of your club going downhill, is its failure to serve the members in a way that they expect or have been promised.

Most club principals who have 'been there-done that' would agree that it is not all beer and skittles, but immense satisfaction can be derived out of building up a respected CB club with a multitude of members. But some in reading these notes will wonder whether it is all worthwhile. But do not despair — if in your neighborhood CBers appear to be a little disorganised and in need of direction, get them together in some simple fashion.

Let the togetherness of CB radio operation progress in a way that new friends can be made and your common interests served. If you create a club, to join the list of ACBRO affiliates appearing in these pages may be a wise decision. To be kept informed in radio matters is important. Reading R&C and ACBRO membership are two of the few ways in which this can be achieved.

So while these notes are presented under the respected banner of ACBRO Inc, they are not intended to be strict guidelines but, as suggested at the start, just a few hints to prompt thought.

If setting up your own club now appears to be placed on the back burner, or in the too-hard basket, then consult one of the clubs near your station, ask about becoming a member, and if you're invited to take out membership, do so conscientiously, knowing that you can only get out of any enterprise that which you are prepared to put in...

ACBRO ASSOCIATED CLUBS

Below is a list of clubs and organisations affiliated with ACBRO Inc. If you have one of them in your area, please give them your support of membership. Full details can be obtained by contacting the group of your choice from the list which follows.

For club membership or affiliation inquiries, please contact: **ACBRO Inc**, PO Box 170, Walkerville, South Australia 5081

A.M.O.S. CB Radio Club International	PO Box 351, Broken Hill, NSW 2880
Albany Communications Group	65 Hassell Street, Elleker, WA 6330
Aust Red-Heeler Soc Radio Club	PO Box 443, Bribie Island, QLD 4507
'Blue O' Radio Group	PO Box 53, Monaro Cres, ACT 2603
Broken Hill UHF Repeater Club Inc	PO Box 1023, Broken Hill, NSW 2880
Burnie Citizens Radio Club	PO Box 655, Burnie, TAS 7320
Canning River Radio Club	53 Parkside Ave, Mt Pleasant, WA 6153
Central West CB Radio Club Inc	PO Box 628, Orange, NSW 2800
Cherokee Indian Aust Group	PO Box 1679, Mildura, VIC 3500
Cleveland Bay Radio Club	PO Box 1641, Aitkenvale, QLD 4814
Coal Miners Wonthaggi CB Club	PO Box 420, Wonthaggi, VIC 3995
Dirty Dozen Radio Group	PO Box 380, Blair Athol, SA 5084
East Coast Radio Club	PO Box 412, Bexley, NSW 2207
Echo Romeo CB Assoc	PO Box 302, Morphett Vale SA 5162
Eureka CB Radio Club	PO Box 27, Reynella, SA 5161
Felix Radio Club	PO Box 78, Goodna, QLD 4300
Gippsland Repeater Assoc Inc	PO Box 555, Maffra, VIC 3860
Gosford Citizens Radio Club	PO Box 447, Gosford, NSW 2250
Home Brew Makers CB Radio Club	PO Box 224, Gratton, QLD 4343
Inlander CB Radio Club	PO Box 5712, Rockhampton, QLD 4702
International Bluck Duck DX Group	PO Box 224, Gratton, QLD 4343
Kilo Romeo Circle of Friends	PO Box 16, Cleveland, QLD 4163
LT Club Inc	PO Box 626, Launceston, TAS 7250
MBV 08 Repeater Assoc	Post Office, Charleston, SA 5244
Mega Mouth International	PO Box 1534, Launceston, TAS 7250
Mike Kilo Social Radio Club	PO Box 193, Boolaroo, NSW 2284
Murray Bridge Agric & Hort Society	PO Box 315, Murray Bridge, SA 5253
Naracoorte UHF Association	PO Box 465, Naracoorte, SA 5271
Oscar Romeo CB Club	PO Box 203, North Geelong, VIC 3215
Overland Radio Club	PO Box 1010, Murray Bridge, SA 5253
Pioneer Radio Association (SA)	PO Box 1017 Salisbury, SA 5108
Pioneer Radio Association Aust	PO Box 112, Bentley, WA 6102
Port Adelaide Radio Club	PO Box 352, Port Adelaide, SA 5015
Qld Blue Heeler Soc Radio Club	PO Box 1122, Castle Hill, NSW 2154
Qld Radio DX International Club	PO Box 586, Warwick, QLD 4370
Radio City Australia	26 Wootten Street, Greenacres, SA 5086
Radio Hobart CB Club	PO Box 545, Glenorchy, TAS 7010
Riverland CB Club	PO Box 742, Loxton, SA 5333
Rotten Radio Group Intnl	PO Box 4, Dry Creek, SA 5094
SA Rotten Radio UHF Association	PO Box 4, Dry Creek, SA 5094
Samba Club	PO Box 16, Salisbury, SA 5108
South-West District CB Radio Club	PO Box 620, Warrnambool, VIC 3280
Sun Centre CB Radio Club	PO Box 912, Swan Hill, VIC 3585
Sydney Radio Group	PO Box 185, Gordon, NSW 2072
The Pathfinder Radio Soc Club	PO Box 24, Woodridge, QLD. 4114
The Triple 'Rs' Group	451 Regency Road, Sefton Park, SA 5083
Transworld CB Radio Club	90 Crozier Avenue, Daw Park, SA 5041
Transworld Sidebanders (X-Ray Club)	13 First Street, Port Pirie, SA 5540
Tweed Radio DX Group Intnl	PO Box 773, Murwillumbah, NSW 2484
UHF Assoc of WA Inc	PO Box 1238, East Victoria Park, WA 6101
Ultra-Lite Radio Club Inc	PO Box 17, Strathpine, QLD 4500
Vic Red Heeler Radio & DX Group	PO Box 1802, Ballarat, VIC 3354
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Readers of **RADIO and COMMUNICATIONS** may use the **CLASSIFIEDS** column to the extent of 25 words absolutely free! This offer applies only to private "For Sale" or "Wanted" classified listings, and to computers, software or computer peripherals and other hobby communications equipment — scanners, amateur or CB transceivers, etc.

A **limit of one classified** advertisement applies to each advertiser. **Any additional words must be paid for or the advertisement will not be accepted.** A nominal fee of $4 per additional 25 words or part thereof will apply. This fee should accompany your material if applicable. Please enclose this fee or your advertisement will not appear. Preference is given to paid advertisements, and we receive an awful lot of them each month...

Your advertisement's inclusion **cannot be guaranteed**, but every effort will be made to place your advertisement in the issue following receipt of copy. The 25 words **must include your name and phone number.**

The publisher reserves the right to amend or reject any advertising material considered unsuitable for publication.

No correspondence will be entered into.

Repeat **CLASSIFIEDS** advertisements will be accepted for a fee of $4 for every 25 words — *including* the first 25.

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Advertisements for **commercial goods or services** will not be accepted for publication in these classifieds pages. This classified section is for **private sales/purchases** only.

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PLEASE ENSURE THAT YOUR CLASSIFIED IS LEGIBLE. ALTHOUGH YOU KNOW WHAT YOU'RE ADVERTISING A TYPIST DOESN'T!

Sorry, folks, but we have dropped a number of classified adverts from this issue, simply because they were for commercial goods and services or otherwise considered unsuitable for publication. We urge you to *read* the fine print at the top of page 91, as unsuitable adverts will continue to be dropped in future.

Note also that only the first 25 words are free. If your advert is longer than 25 words, and payment is not enclosed, it will be dropped altogether.

Also, if you wish to repeat an advertisement in a subsequent issue(s), payment is required for *all* words. We also dropped several repeats for which payment had not been received.

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• **ARRL** Handbook, 1991 edition, covers theory & construction, the Bible of radio, as new $30. VK2GEL (02) 365 4966

• **Heath** HW-101 all-band HF SSB xcvr $350. **Heath** HD-15 phone patch $75. **Heath** SB-610 monitorscope $200. All with hndbks, immaculate cond. VK2KJ (043) 58 8450. Licensed amateurs only.

• **Icom** IC-PS15 pwr supp (new cost $615) $300. Peter, VK2FFA (043) 24 4160

• **Kenwood** TS-180S HF xcvr with manual, no mic, in GC $450 ono. Gavin, VK2MLU (064) 95 2276

• **MFJ**-1278 TNC as new $300 ono. Alex, VK2YMC (02) 416 1362

• **MFJ**-557 Morse oscillator with Morse key, earphone jack, volume & tone control $70. Ernest, VK2KYA (02) 771 2561 A/H, (02) 906 2628 B/H

• **Packet** station two C64s, two drives, color monitor, Digicom modem, all cables & access. Heaps US & local software, see running. $400 ono. Bob, VK2ZO (02) 609 4818

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• **Yaesu** FT-101E HF xcvr with key $500 ono. **Azden** PCS-2000 2m xcvr 5/25W $300 ono. Other items for clearout. Manuals for above. Paul, VK2DMV (066) 52 4389. Licensed amateurs only.

• **Yaesu** FT-101ZD HF xcvr c/w mic, workshop manual, handbook, WARC bands, good order $350. David, VK2BDT (048) 21 5036. Licensed amateurs only.

• **Yaesu** FT-990 all mode xcvr with 5-band HF trap vert ant, both still in packing cases & brand new — never even touched! My price $3500 for both. I cannot possibly keep the radio & vert, which were bought on an impulse

QSL CARD COLLECTION

Please make donations of amateur QSL cards to the WIA QSL collection and save something for the future.

Also, if helping a silent key estate, please contact Ken Matchett, VK3TL, 4 Sunrise Hill Road, Montrose 3765, or phone (03) 9728 5350. Arrangements can be made for large quantities of cards.

Can you spare a few?

Will send anywhere in Aust free. Timothy, VK3FHI (050) 27 3603. Licensed amateurs only.

VK3 AREA

• **Tower** 35ft tilitover 40ft with mast, one person operation, 2ft sections, bearing, rotator (needs work). I dismantle, buyer collects, GC, the lot $250. Damian, VK3EHP (053) 52 4183

• **Icom** IC-781 top shelf HF xcvr, $6500. All reas offers cons. **Kenwood** TL-922 linear amp, 1 set new tubes, 1 set low hrs 3-500s, $2500 GC. Also: 40m 4 square array vert beam $400. Two 500ft legs, V beams, timber support poles, reas offers consid. One 100ft telotower, tilt with s/steel guys $600. One tilt mast 60ft H/D timber & alum cons guyed with cables $250. MFJ MFJ-249 HF/VHF analyser 1.8-170MHz as new cond $275. Andy, VK3WH (054) 28 5134 all hours. Transmitting gear sold to Licensed amateurs only.

• **Icom** IC-2GXAT 2M 7W HT with CTCSS enc/dec, DTMF, 130-174MHz rx c/w batt case, soft case, EC $450. Damian, VK3JBL (03) 9571 3877. Licensed amateurs only.

• **Kenwood** TS-850S HF xcvr with PS-15 pwr supply, Kenwood SP-31 spkr, Daiwa DC-7001 rotator, Morse key, Kenwood mics, MC-85, MC-60 Cushcraft A3S 3-el tribander, coax, switch, 80m dipole, cable, bits'n'pcs, NEC VX-101A Teletext decoder, books, manuals, boxes... Genuine reason for sale, could sep or the lot $3995 ono. Stan, VK3VJO (051) 55 3475. Transmitting gear sold to Licensed amateurs only.

• **Wanted**: Enthusiastic ten year-old lad requires manual (copy?) for DX-200 rcvr — father has *no* idea!! Please help. Will pay costs etc. Trent, (053) 91 1890

• **Wanted**: Operators manual for Kenwood TS-520S. Warren Rudd, C/-Pheasant Creek Post Office, Vic or phone (057) 86 5383

• **Wanted**: AC pwr supp for Swan 240 xcvr to complete restoration project. Orig SW-117 supply with spkr preferred, or suitable supply in working order. **Also** single coil Z match antenna tuner. Dick, VK3LDC (053) 30 1927

• **Yaesu** FT-4700RH dual-band xcvr complete with mic, bckt, manual & orig carton EC. Never been mobile $650 **Yaesu** spkr SP-5 EC $175. John, VK3XBC (060) 27 5288. Transmitting gear sold to Licensed amateurs only.

• **Yaesu** FT-101E HF xcvr, YD-148 desk mic, DC/DC converter, fan, manuals, speech processor $550. **Icom** IC-211 10W 2m all-mode base station with inbuilt PS — an original beauty! $450. **AWA** RT-80 xcvr with remote control head, suit 2m packet $75. Also transformer: 2100V, 600VA $25; caps 470MF 385V PCB mount $8ea; Solder 250g rolls, 0.355mm dia $10ea. Lee, VK3GK (03) 9544 7368. Transmitting gear sold to Licensed amateurs only.

• **Repeater** suit 70cm: Philips FM-815 rack mount 50W continuous $1000. David, VK3KCX (03) 751 1495. Licensed amateurs only.

• **TET**-Emtron TE-23M minibeam 10-15-20 $275 (list $495). **Green** screen monitor, 30cm (12") $45. **Sabtronics** DMM (req. 6VDC) $20. Andy, VK3UJ (03) 9726 8879

• **Azden** PCS-300 2m HT, ext spkr/mic, chrgr, svce manual, soft case, VGC $150. Graham, VK3KOA (03) 9593 1397. Licensed amateurs only.

• **Antennas,** unused: Hoxin 2m beam 6m 4-el. Hoxin Discone VHF/UHF incl. cable. Coaxial cable new Belden 9913 40m, 8267 (120m) 75Ω 15mm dia. Low loss (200m) Low loss ACME connectors & adaptors (200) new. LDF-450 with connectors 3 lengths. 10,15,25m S/hand. 22x1.8m triangular mast, sections. New, guy wire ass fittings. George (0418) 51 9430 or (053) 32 4359

• **Alpha Delta** SWL DX sloper antenna. Ideal for confined areas, world class performance, utilises heavy duty transmit components, broadband low-Q RF choke, resonators $95. Keith, VK3MDH (03) 9570 7592

• **Tono** 7000E EC as new, complete with inst manual & svce manual $400. John (055) 23 1025

• **Radio antennas** for short wave rcvrs. Wire dipoles with coax, new $100ea. Dipoles center insulators with SO239 for coax to suit dipoles $350ea. 400 insulators — offers? Peter (055) 72 1483

• **Wanted**: Universal M-400 decoder. Shane (015) 05 4589, (052) 23 2450

• **Wanted**: Antenna TH-3 mk3 or sim (eg Telrex or Cushcraft) also info on a Marconi rx, covers LF to SHF. Jim, VK3YJ (03) 9315 9387

• **DECEASED ESTATE VK3BEH: Kenwood** TS-680S HF+6M xcvr $1050. **Kenwood** AT-230 ant tuner $150. Paul (050) 25 2001. Transmitting gear sold to Licensed amateurs only.

• **Icom** IC-P2AT 2m HT xcvr, 100mems, broadband receive & many other feats incl scanning modes $250. Paul, VK3ERC (03) 9568 2171. Licensed amateurs only.

• **Wanted**: PacComm Tiny-2 in GC, pref Yaesu mic input, reas price, Graeme, VK3MBZ (03) 9435 4336

• **Wanted**: inst manual or circ diag for Johnson Viking 'Thunderbolt' linear. Milan, VK3GAZ (03) 317 4032 phone/fax

• **Uniden** 2020 HF xcvr with hand mic & matching Uniden spkr. Unit GC $300. Peter, VK3QI (03) 9889 6396. Licensed amateurs only.

• **AOR** 1500 scanner, still under warrnty $500 *or* swap for dual band HT to go with new call sign! Simon, VK3HOT (03) 9852 2082 or (0414) 33 0015. Can deliver.

• **Kenwood** TS-940S HF xcvr with orig box, manual, mic etc VGC $2550. John, VK3HW (052) 51 2623. Licensed amateurs only.

• **Yaesu** FT-101E HF xcvr & Yaesu FV-101B ext VFO, like new, in orig boxes, with mic, all leads, spare PA tubes $950 (won't split). **Kenwood** TR-2500 2m HT with SMC-25 spkr/mic, SC-4 soft case, ST-2 base stand/chrgr, MS-1 mobile stand/chrgr, two PB-25 NiCd batts $250. David, VK3KGF (03) 9687 8807 or (018) 34 2134. Licensed amateurs only.

VK4 AREA

• **AEA** PK-232MBX multi-mode controller incl phase mod board for satellite operation & latest software, cables etc. $600 ono. Jim, VK4BS (07) 3286 4730

• **AEA** PK-232MBX multi-mode TNC incl PacTOR/Fax, Pakratt2 & Pakratt/Win software, manuals, CCT/diags VGC $550 the lot. User upgrading. Frank, VK4DFM (071) 29 4311

Please note that all phone numbers are after hours unless otherwise noted.

...CLASSIFIEDS...CLASSIFIEDS...CLASSIFIEDS...

• **Antenna:** Terlin Outbacker 'Perth'. Covers 10-80m + RFDS freq 2020. Light blue in color, 4mths old, paid $385 sell $300. PC. Brendan (076) 67 4103

• **Kenwood** TH-75A dual band HT with NiCds, chrgr & BC-11 fast chrgr. In orig boxes & cond $575. Keith, VK4KL (07) 3824 0897. Lic am's only.

• **Kenwood** TL-922 HF linear, 8 mths old, as new $3800. Also **Kenwood** linear, 3yrs old a little work needed $2750 ono. **Datong** multi-mode audio filter mode FL-3 complete $385. **AEA** com pakratt with fax $125. Bob, VK4RM (074) 49 7151. Transmitting gear sold to Licensed amateurs only.

• **Kenwood** TM-742A dualband 50/35W FM xcvr, unmarked $900. Danny VK4DRY (074) 79 4340. Licensed amateurs only.

• **Kenwood** TS-120V HF xcvr with mic, hndbk PC, $400 ono. **CPI** 200W linear amp, covers 10-80m. PC $200 ono. Jon, VK4MMM (074) 98 6969. Licensed amateurs only.

• **Kenwood** TS-670 quadbander 7/21/28/50 MHz plus HF rcve freq coverage $750. Steve, VK4GY (07) 3893 1753. Licensed amateurs only.

• **Vintage** Australian equipment: Crammond CSB 100C & CSB-150 marine SSB/AM xcvrs GC $100ea. Valve tester Univeristy Graham Instruments supertester $100. RF Oscillator Airmec time 871 ex-Army $100. Hewlett Packard 1801A 50MHz CRO, time base inoperative C/w manuals $100. (Or will purchase sim model for spares.) Paul, (077) 89 2259

• **Wanted**: 250W dummy load wattmeter Bird model 43 must be VGC. Ron, VK4AJV (071) 62 3445

• **Wanted**: Kenwood DG-5 digital display for TS-520S. Also user manual for TS-520S. Ken (07) 3408 4353

• **Wanted**: Yaesu MD-1C8 desk mic. Jon, VK4MMM (074) 98 6969

• **Yaesu** FT-101Z HF xcvr with SWR/power meter, tuner, mic, Coman vert, 7m metal tower, $800 or offer. **Realistic** DX-302 comms rcvr $100. **BWD**-5390 dual/trace scope with probes $500. **Leader** LSG16 RIF sig gen. **Leader** LAG AF gen $200. **Sinclair** PFM-200 freq meter $100. **AWA** DM-500 DMM $100, approx 60 misc valves $20. John, VK4CNN (07) 5533 9336. Transmitting gear sold to Licensed amateurs only.

• **Yaesu** FT-757GX HF xcvr with FC-757AT auto ATU. Both EC. **Yaesu** SP-4 spkr incl. Boxed with manuals $1250. Mal (071) 26 7284. Licensed amateurs only.

• **Yaesu** FT-890 all-mode HF xcvr 100W, as new, with manuals & 25A pwr supp $1400 the lot ono. Must sell. Maria, (070) 41 1421. Licensed amateurs only.

• **Yaesu** FT-901DM HF xcvr with matching speaker, ATU with meters & four antenna outlets, with spare finals, mic, leads, manual $990 ono. Ted, VK4OW (071) 28 3489. Licensed amateurs only.

• **Yaesu** FT-902 HF xcvr with mic, must be sold $450 ono or consider exchange for 2M mobile. Brett, VK4VLT (07) 899 2349. Licensed amateurs only.

• **Yaesu** YP-150 dummy load wattmeter 150 watt VGC $100. Ron, VK4AJV (071) 62 3445

Please note that all phone numbers are after hours unless otherwise noted.

VK5 AREA

• **Antenna** 8-el log periodic for HF bands, 10-30MHz continuous, all hdwre insts, GC $450 plus freight. Offers considered. Paul, VK5MAP (086) 51 2398

VK6 AREA

• **Icom** AT-150 fully auto ATU with manual, orig carton. Offers? Vaso, VK6VAS (099) 64 2385

• **Kenwood** TS-940S HF xcvr in as new cond with all filters, voice module & manuals $2475. Bill, VK6WJH (097) 34 4374. Licensed amateurs only.

• **Tower** 4-section swivel base, wind-up, complete with guys VGC $1300 ono. Dennis (09) 342 2390

• **Tower** 15m (45ft) 2-section triangular winch-up with winch, tilt base, top, Mast section wall supports etc. Moving interstate; must sell. $500 ono. In Strathalbyn. Marc (015) 97 0847

• **Transistors** final 2SC-2290 matched pair suit TS-120S/130S/430S etc $80. Graham, VK6RO Ph/fax (09) 451 3561

• **Tubes** 572B $60. 811A $30. 5881 6L67C $15. EL-34 $19. 6550WA $45. Ex-RAAF comms rcvr **Racal** RA-17 $300. Phil, (09) 272 6483

• **Wanted**: Icom IC-451A 70cm base rig, **Dentron** MLX-20 or MLX-40, **Kenwood** TR-3200, pref in WO. Norm, VK5GI (08) 338 1815

• **Yaesu** FT-101E HF xcvr in as new cond & in PWO $395. **Revex** SWR/pwr meter 1.8-60MHz 20/200/2kW power scales, as new, still in box $165. Adrian, VK6TCC (09) 249 9357. Transmitting gear sold to Licensed amateurs only.

• **Yaesu** FT-107M HF xcvr with FC-107 ATU, SP-107 spkr. **Kenwood** TR-2400 2m HT. **Chirnside** 80-10m vert antenna. $1500 the lot. Bill, VK5NWL (08) 252 1319

• **Yaesu** FT-77 HF xcvr with hndbk, mic, 100W, top cond $500 ono. **Kenwood** TR-7950 2M xcvr, hndbk mic 45W top cond $250. Both sets used as bases. Frank, VK6ALF (09) 349 9270

VK7 AREA

• **Kenwood** TS-430S HF xcvr with MC-60 desk mic, Wawassee SWR/power meter, Lodestar DM-4062 GDO, all in EC $950. Rick (004) 96 1240. Licensed amateurs only.

• **Kenwood** TS-520S HF xcvr, YO-100 monitor scope & 5-band vert ant, all GC. For *sale or swap* for dual-band 2m/70cm mobile with ant. Richard, VK7HRE (004) 33 3178. Licensed amateurs only.

VK8 AREA

• **Icom** IC-735 HF xcvr with keyer & 200Hz CW filt. $1000 ono. Alan, VK8AC (089) 27 5800

• **Shack Clearout**: Yaesu FT-901D HF xcvr $400. MFJ-948 ATU SWR/pwr meter $100. Yaesu FT-757GX mkII HF xcvr, with Yaesu FP-757HD pwr supp & Yaesu FC-757AT auto ATU $1500. IBM PS-1 486SX, CD-ROM, sftwre incl JVFAX, Hamcom with demodulator $2000. Citoh 24-pin printer free. Stuart, VK8NSB (089) 80 5686. Transmitting gear sold to Licensed amateurs only.

Please do NOT quote PO Box numbers without supplying your full residential address. This is the LAW.

...CLASSIFIEDS...

Scanners and communications receivers etc

• **AOR** AR-1500 scanner, still under warrnty $500 *or* swap for dual-band HT to go with new call sign! Simon, VK3HOT (03) 9882 2082 or (0414) 33 0015. Can deliver.

• **AOR** AR-3000A all-mode rcvr. Covers 100kHz to 2000+ MHz $1500. Pete, VK2DFR (02) 438 3396. Transmitting gear sold to Licensed amateurs only.

• **AOR** AR-3000A scanner 100kHz to 2036MHz, 400 mem chnls, computer control capabilities, all modes incl SSB $1350. John, (07) 3359 9084

• **Icom** IC-R7000 comms rcvr/scanner 25-2000MHz with instr & workshop manuals, as new $950. Rob (08) 295 7401

• **Icom** IC-R71A HF comms rcvr with matching spkr & hndbk. $1100 & free freight. David (004) 37 2087

• **Kenwood** R-5000 HF comms rcvr, all modes, 100kHz-30MHz incl computer control access IC-10 kit, IF-232C interface, sftwre, Emtron multiband dipole antenna 30/43M RG59b/u feeder cable with PU manuals & orig box. Only 3 yrs old. Bargain $1300 only. Cairns. (070) 55 7414

• **Realistic** DX-302 comms rcvr $100. John, VK4CNN (07) 553 9336

• **Realistic** PRO-2004 25-520MHz & 760-1300MHz scanner. 400ch, AM NBFM & WBFM PC $395 ono. David, VK6BDA, ph/fax (09) 382 4681

• **Realistic** PRO-2005 rcvr/scanner. *Swap for* Yaesu FRG-7700, Kenwood R-1000 or sim rcvr. Graeme Wilson, 'Ashfield', Mt Seymour, Tasmania 7120 or ph/fax (002) 54 7324

• **Wanted**: Enthusiastic ten year-old lad requires manual (copy?) for DX-200 rcvr — father has *no* idea!! Please help. Will pay costs etc. Trent, (053) 91 1890

• **Wanted**: Yaesu FRG-7700 rcvr with mem module, must be VGC. Bill, (07) 3300 2289

• **Yaesu** FRG-7700 digital comm rcvr with mem operator svce manual immac cond. John, VK2EJP (02) 872 5043

• **Yaesu** FRG-965/9600 VHF/UHF scanner, mobile mount, pwr supp, handbook, service manual, mint cond $500. **Yaesu** FT-7 HF xcvr, mobile mount, handbook, VGC $350. Rob, VK2CZ (066) 54 2782

• **Yupiteru** multiband rcvr MVT-7000. Covers 0.1-1300MHz $500. Jason, (02) 925 4731 B/H, (019) 46 6529 A/H

CB EQUIPMENT

• **Electrophone** TX-474 UHF/FM CB HT with Icom BP-8 NiCd battery $400. Randall, VK2EFA (080) 87 5285

• **Realistic** 27MHz 40-chnl CB, plugs into car lighter. With magnetic base antenna $75. (Sale, Vic) Derek (051) 43 1362

• **Standard** GX-2000 UHF CB, commercial grade, has scanning with CTCSS, DTMF incl mobile antenna $400 ono. **Uniden** AX-144 AM/SSB radio with Itron base antenna $250 ono. (Melbourne.) Andrew (015) 83 6094

• **Wanted**: Circuit diagram & workshop manual for Pearce Simpson super Bengal MK111 &/or Uniden Madsion. Will pay for all costs. Barry, (02) 672 3171

The quick guide to important Usenet news groups

continued from page 81

alt.radio.uk
aus.radio
aus.radio.amsat
aus.radio.packet
aus.radio.wicen
rec.antiques.radio+phono
rec.ham-radio
rec.ham-radio.packet
rec.ham-radio.swap
rec.radio.broadcasting
rec.radio.info
rec.radio.noncomm
rec.radio.swap

Scanners
alt.radio.scanner
alt.radio.scanner.uk
rec.radio.scanner

CB
rec.radio.cb

Shortwave
rec.radio.shortwave

Satellite
alt.satellite tv.europe
rec.video.satellite.dbs
rec.video.satellite.misc
rec.video.satellite.tvro
sci.geo.satellite-nav

§BSD
alt.riscbsd
comp.pugs.2bsd
comp.bugs.4bsd
plus 9 comp.unix.bsd newsgroups

§Linux
alt.os.linux
aus.computers.linux
comp.os.linux.announce
comp.os.linux
plus 28 more newsgroups

§Macs
alt.binaries.mac.games
alt.mac.games.binaries
alt.sys.mac.newusers-help
aus.computers.mac
aus.mac
comp.binaries.mac
plus 30 other computer systems newsgroups

§DOS
alt.msdos.programmer
comp.archives.msdos.announce
plus 9 comp.os.msdos.

MS-Windows
some 29 different MS-Windows newsgroups

§Computers in General
aus.computers.ibm-pc
comp.binaries.ibm.*
comp.systems.§ (for hardware,software,games,sound-cards,misc,ps2, etc)
aus.computers.*
§ indicates more newsgroups under this heading

AMATEUR VOICE REPEATER LIST — 10 to 2 METRES

Please note that this listing is intended as a guide only. The data has been very kindly supplied to us by the federal WIA. We want our lists to be as accurate as possible, otherwise there's really very little point in publishing them. If you think a listing for your area is inaccurate, please let us know. We'll be very grateful, and the updated data will appear in the next listing. Write to **Repeater Lists**, R&C Magazine, Box 1 Yarra Road, Wonga Park, Victoria 3115. We'll also pass your information on to the WIA.

Sorry, but space limitations prevent us from listing more than input and output frequencies, callsign and location.

Out MHz	Input MHz	Call	Location
10 & 6 METRE REPEATERS			
29.620	29.520	VK2RUW	Knights Hill
29.620	29.520	VK5RLZ	Elizabeth Sth
29.640	29.540	VK2RHF	Wagga Wagga
29.640	29.540	VK3RHF	Mt Dandenong
29.640	29.540	VK6RHF	Roleystone
29.660	29.560	VK4RCC	Camp Mountain
53.550	52.550	VK2RAY	Black Range Trig
53.550	52.550	VK2RIC	Parrots Nest
53.550	52.550	VK2RSJ	Kurrajong
53.550	52.550	VK3RMH	Wattle Glen
53.575	52.575	VK2RJB	Sanctuary Point
53.575	52.575	VK2RTM	Tamworth
53.575	52.575	VK3RDD	Cockatoo
53.600	52.600	VK3RMR	Mt Lookout
53.625	52.625	VK2RSN	Mt Sugarloaf
53.675	52.675	VK2RMB	Terrey Hills
53.675	52.675	VK3RTN	Lake Mountain
53.725	52.725	VK4RGA	Amy's Peak
53.725	52.725	VK4RIK	Mt Haren
53.725	52.725	VK4RLB	Acacia Ridge
53.750	52.750	VK5RDX	Chandlers Hill
53.775	52.775	VK4RAF	Black Mountain
53.775	52.775	VK4RRC	Mount Mee
53.800	52.800	VK6RTH	Tic Hill
53.825	52.825	VK7RMD	Mt Duncan
53.850	52.850	VK2RWI	Dural
53.900	52.900	VK3RMS	Olinda
53.950	52.950	VK4RBS	Bardon
53.975	52.975	VK3RGM	Mt Buller
53.975	52.975	VK4R??	Mount Gravatt
TWO METRE REPEATERS			
ACT and New South Wales			
146.625	146.025	VK2RBB	Byron Bay
146.625	146.025	VK2RLD	The Oaks
146.650	146.050	VK2RCH	Mount Coramba
146.650	146.050	VK2RDX	Mount Bindo
146.650	146.050	VK2RMI	Terry Hie Hie
146.675	146.075	VK2RCV	South Grafton
146.675	146.075	VK2RTY	Blacktown
146.700	146.100	VK2RAO	Mount Canobolas
146.700	146.100	VK2RMU	Little Forest
146.700	146.100	VK2RPM	Middle Brother
146.725	146.125	VK2RAG	Somersby
146.750	146.150	VK2RFS	Mount Mumbulla
146.750	146.150	VK2RTM	Mount Crawney
146.750	146.150	VK2RWG	Mount Flackney
146.775	146.175	VK2RTZ	Sugarloaf Ranges
146.800	146.200	VK2RCC	Needle Mountain
146.800	146.200	VK2RIC	Parrots Nest
146.800	146.200	VK2RLE	Heathcote
146.800	146.200	VK2RTD	Kendall Trig
146.825	146.225	VK2RET	Bundook Mountain
146.825	146.225	VK2RHR	Mount Gibraltar
146.850	146.250	VK2RAB	Mount Kaputar
146.850	146.250	VK2RAW	Mount Murray
146.850	146.250	VK2RGF	Mount Bingar
146.875	146.275	VK2RMB	Terrey Hills
146.900	146.300	VK1RAC	Black Hill
146.900	146.300	VK2RAN	Mount Sugarloaf
146.900	146.300	VK2RRT	Boona Mountain
146.925	146.325	VK2RGR	North Ryde
146.950	146.350	VK1RGI	Mount Ginini
146.950	146.350	VK2RNE	Mount Rumbee
146.975	146.375	VK2RAN	Mt Sugarloaf
146.975	146.375	VK2RMS	Bald Hill
147.000	146.400	VK2RWI	Dural
147.025	147.625	VK2ROT	Paddington
147.050	147.650	VK2RBM	Mount Druitt
147.100	147.700	VK2RWM	Grenfell
147.100	147.700	VK2RZL	Mount Arthur
147.125	147.725	VK2RER	Bulloc Bulloc Hill
147.150	147.750	VK2RWS	Chatswood
147.200	147.800	VK2RHW	Mount Woolooma
147.200	147.800	VK2RSD	Mount Cambewarra
147.200	147.800	VK2RWH	Warners Bay
147.200	147.800	VK2R??	Mulwala
147.225	147.825	VK2RST	Lane Cove
147.225	147.825	VK2RYL	Bald Mountain
147.250	147.850	VK2RNS	Asquith
147.275	147.875	VK2RIL	Sublime Point
147.300	147.900	VK2RTS	Winmallee
147.375	147.975	VK2RGL	Cabbage Tree Mt
147.925	147.325	VK2RGN	Mount Gray
Victoria			
146.650	146.050	VK3REG	Donald's Knob
146.650	146.050	VK3RGV	Mount Wombat
146.700	146.100	VK3RML	Ferny Creek
146.700	146.100	VK3RNC	Mount Mittamatite
146.700	146.100	VK3RON	Ouyen
146.750	146.150	VK3RBA	Mount Buninyong
146.775	146.175	VK3RAG	Rennies Hill
146.800	146.200	VK3RLV	Mount Tassie
146.800	146.200	VK3RMA	Mildura
146.850	146.250	VK3RMN	Kinglake
146.875	146.275	VK3RRM	Mount Bullengarook
146.900	146.300	VK3RBS	Smeaton Hill
146.900	146.300	VK3REB	Mount Nowa Nowa
146.900	146.300	VK3RSH	Swan Hill
146.950	146.350	VK3RWZ	Mount William
147.000	146.400	VK3RGL	Mount Anakie
147.000	146.400	VK3RNE	Mount Big Ben
147.025	147.625	VK3RGS	Mount Fatigue
147.025	147.625	VK3RMK	Mount Kerang
147.050	147.650	VK3RHO	Mount Hotham
147.050	147.650	VK3RVL	Robinvale
147.050	147.650	VK3RWL	Mount Warrnambool
147.075	147.675	VK3RCR	Heathmont
147.100	147.700	VK3RPB	Mount Porepunkah
147.100	147.700	VK3RSG	Bass Hill
147.125	147.725	VK3RGC	Montpelier
147.150	147.750	VK3RCV	Mount Alexander
147.175	147.775	VK3REC	Olinda
147.225	147.825	VK3RWG	Mount Baw Baw
147.250	147.850	VK3RMM	Mount Macedon
147.275	147.875	VK3ROW	Beech Forest
Queensland			
146.625	146.025	VK4RGT	Maurice Hill
146.625	146.025	VK4RGY	Mount Boulder
146.650	146.050	VK4ROM	Grafton Range
146.675	146.075	VK4RET	Mount Kiangrow
146.675	146.075	VK4RTA	Longlands Gap
146.700	146.100	VK4RAR	Mount Archer
146.700	146.100	VK4RAT	Mount Stuart
146.700	146.100	VK4RGC	Springbrook
146.700	146.100	VK4RMI	Four Mile Hill
146.725	146.125	VK4RSB	Mount Gordon
146.750	146.150	VK4RDD	Mount Lofty
146.800	146.200	VK4RBU	Mt Goonaneman
146.800	146.200	VK4RTI	Thursday Island
146.800	146.200	VK4RWP	Weipa
146.825	146.225	VK4RCR	Dalveen
146.850	146.250	VK4RHT	Hann Tableland
146.850	146.250	VK4RLE	Longreach
146.850	146.250	VK4RSC	Buderim
146.875	146.275	VK4RBS	Alexandra Hills
146.875	146.275	VK4RTB	Mount Tabletop
146.900	146.300	VK4RAI	Mt Stradbroke
146.900	146.300	VK4RGA	Amy's Peak
146.925	146.325	VK4RHR	Hodgson Range
146.925	146.325	VK4RRC	Mount Mee
146.950	146.350	VK4RBD	Blackdown T'ld

146.950	146.350	VK4RCA	Bellenden Ker
146.950	146.350	VK4RGG	Nerang
146.975	146.375	VK4RRR	Blue Mountain
147.000	146.400	VK4RBN	Mount Glorious
147.000	146.400	VK4RMK	Black Mountain
147.150	147.750	VK4RAG	Spring Hill
147.175	147.775	VK4RWM	Ipswich
147.300	147.900	VK4RQT	Mount Glorious
147.325	147.925	VK4REP	Middlemount
147.350	147.950	VK4REP	Middlemount
147.350	147.950	VK4RII	Mt Inkerman Burde
147.375	147.975	VK4REP	Middlemount
147.375	147.975	VK4RMO	Coominglah Monto
147.375	147.975	VK4RWB	Mount Bertha
147.625	147.025	VK4RMV	Westwood Range
147.650	147.050	VK4RBT	Mount Cotton
147.675	147.075	VK4RBT	Mount Cotton
147.800	147.200	VK4RBG	Bundaberg
147.825	147.225	VK4REG	Kallangur Hts
147.850	147.250	VK4RCB	Mount Devlin
147.950	147.350	VK4RLR	Rockhampton

South Australia

146.625	146.025	VK5RLZ	Elizabeth South
146.650	146.050	VKSRNC	Naracoorte
146.675	146.075	VKSRSV	Willunga
146.700	146.100	VK5RMN	The Bluff
146.750	146.150	VK5RAC	Pillaworta Hill
146.800	146.200	VK5REP	Coolanie
146.825	146.225	VK5RBV	Angaston
146.850	146.250	VKSRHO	Houghton
146.900	146.300	VK5RMG	The Bluff
146.925	146.325	VK5RLH	Bumbunga Hill
147.000	146.400	VKSRAD	Crafers
147.825	147.825	VKSRBG	Roseworthy
147.875	147.275	VKSRAE	Mount Arden
147.925	147.325	VKSRLD	Berri
147.925	438.575	VKSRLD	Berri

146.625	146.025	VKGRNC	Walliston
146.650	146.050	VK6RBY	Bunbury
146.675	146.075	VKGRNR	Hudgejah
146.675	146.075	VKGRCA	Whim Creek
146.700	146.100	VK6RAP	Roleystone
146.700	146.100	VK6RWR	Wickham
146.725	146.125	VK6RAL	Albany
146.750	146.150	VK6RAT	Forbs Hill
746.750	146.150	VK6RLM	Lesmurdie
146.750	146.150	VK6RES	Esperance
146.800	146.200	VK6RTH	Tic Hill
146.800	146.200	VKGRWP	Karratha
146.825	146.225	VKGRAA	Mt Barker
146.850	146.250	VK6REX	Exmouth
146.850	146.250	VKGRKB	Kambalda
146.850	146.250	VKGRLM	Lesmurdie
146.875	146.275	VK6RSR	O'Connor
146.900	146.300	VKGRMW	Mount William
146.950	146.350	VKGRPD	Fremantle
146.950	146.350	VKGRSG	Goldsworthy
147.000	146.400	VK6RAW	Fairfield
147.000	146.400	VK6RAK	Kalgoorlie
147.000	146.400	VK6RGN	Geraldton
147.000	146.400	VK6RNW	Port Hedland
147.050	147.650	VK6RTY	Roleystone
147.100	147.700	VK6RLK	Chidlow
147.100	147.700	VK6RWC	Millendon
147.125	147.725	VKGRHB	Gin Gin
147.150	147.750	VK6RMJ	Manjimup
147.200	147.800	VK6RCT	Yandon Hill
147.250	147.850	VK6RMS	Mount Saddleback
147.275	147.875	VK6RHW	Hoddywell
147.275	147.875	VK6RWM	Wyalkatchem
147.325	147.925	VK6RKL	Nareling Hill
147.350	147.950	VK6RBN	Chapman Hill

Tasmania

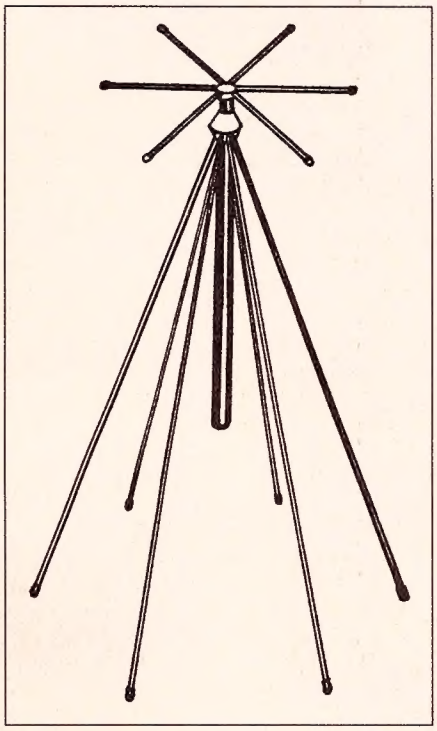
146.625	146.025	VK7RMD	Mount Duncan
146.700	146.100	VK7RHT	Mount Wellington
146.750	146.150	VK7RNW	Lonah
146.900	146.300	VK7REC	Snow Hill
147.000	146.400	VK7RAA	Mount Barrow
147.075	147.675	VK7RWC	Mount Read
147.250	147.850	VK7RAF	Mount Faulkner

Northern Territory

146.650	146.050	VK8RMS	Nhulunbuy
146.700	146.100	VK8RDA	Karama
146.950	146.350	VK8RCA	West Gap
147.000	146.400	VK8RTE	Noonamah

Please advise any corrections to: Box 1 Yarra Road, Wonga Park 3115

Here's yet another chance to ***win!***



RADIO and COMMUNICATIONS would dearly love to give away one of everything we review for you, but life's simply not that easy. We do even better than that this time, though — we have not one but ***three*** of these great Australian-made Benelec scanner discone antennas for you to win!

All you have to do is read the review on page 21 of this issue (to find the answer to a simple question), then put the answer to the question at the bottom of this page on the back on a standard-size envelope along with your name, address and contact phone number, and post it, to arrive no later than Monday, October 9, 1995, to:

RADIO AND COMMUNICATIONS,
DSE/BENELEC READER COMPETITION,
PO BOX 119,
OAKLEIGH,
VICTORIA 3166

And thanks a lot to **Dick Smith Electronics** for supplying the giveaways! Your support, DSE, is gratefully appreciated.

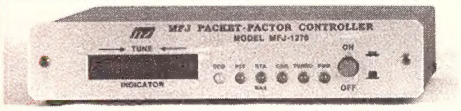
And now, your question: **What is the recommended retail price of the Benelec #02675 discone antenna?**

If you want digital modes why not go to the **ORIGINAL** digital mode specialist

For the last seven years John Day, VK3ZJF (Amateur Radio Actions *"Packet Racket"* columnist has brought you the best in Packet and HF digit mode controllers from the great names in digital modes. For stock, service and expertise we just can't be beaten! Try us!

MFJ Performance you can afford!

MFJ1278B Multimode data controller, 10 modes including Pactor, AMTOR, RTTY, Packet, CW, SSTV, FAX and more. Latest version with enhanced mailbox. $649



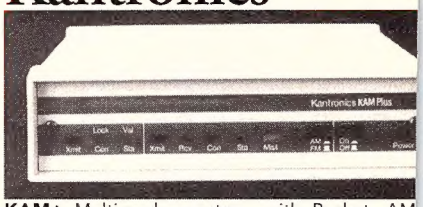
MFJ1276 Packet - PACTOR controller for HF/VHF Packet & HF PACTOR. Best value PACTOR around! $349

MFJ1270C The latest version of this popular VHF packet controller. 32K enhanced mailbox supplied. Best value packet on the market today! $259

- Like to upgrade to a REAL TNC?
- Well for a limited time you can trade in your commercial Baycom, Cavcom, TigerTronics or similar modem for a 100% rebate on a new MFJ or Kantronics controller.
- Just send in your modem complete with all documentation and a copy of your original receipt and we will allow 100% of the price of the modem (not including postage or insurance) as a trade-in.
- Don't delay, this offer is available for a limited time only. Please call if you have any questions!

Offer is conditional on inspection of your modem. It must be complete, functional and be accompanied by the original manual and basically presentable. You will be advised if we do not accept your unit.

Kantronics

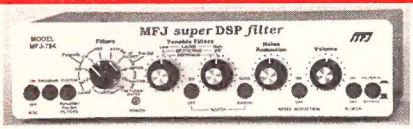


KAM+ Multimode mastery, with Packet, AM PACTOR and new G-TOR as well as CW and RTTY dual port controller has 128K RAM - true luxury! $

KPC-3 All the best features of a Kantronics p controller in a tiny box with low power consum optional 128K or 512K RAM, terrific value! $279

KPC-9612 Dual port 9600 &1200bps can operat radios simultaneously. Everything you expect Kantronics at a price that makes the others jealous!

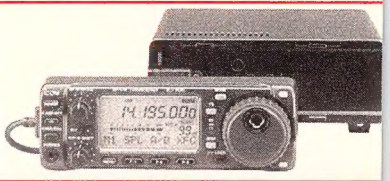
MFJ784 DSP signal processor



Automatically eliminates heterodynes, reduces noise and interference on SSB, AM, CW packet, AMTOR, PACTOR, RTTY, SSTV, WEFAX and FAX as well as weak signal EME and VHF signals.

New enhanced MFJ784B now available

MFJ784B DSP signal processor **$499**



Icoms amazing IC-706 HF+6m+2m mobile — now showing — call for details and prici

Butternut is king!

Not an imitation, but the real thing! And where would you expect to find a quality antenna like Butternut? Why at DAYCOM of cours entire Butternut range of antennas is now **IN STOCK** ready for immediate delivery from DAYCOM. Call for more details, or to place your c

HF6V-X specifications:

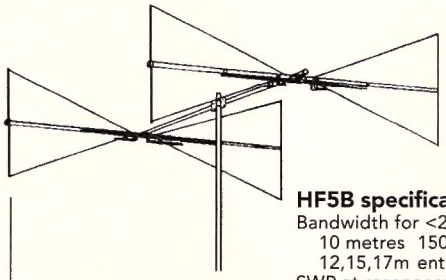
Bandwith for < 2:1 SWR:–

10 metres	1500 KHz
15 metres	entire band
20 metres	entire band
30 metres	entire band
40 metres	280 KHz
80/75 m.	40 to 100 KHz

HF9V-X specifications:

Bandwith for < 2:1 SWR:–

6 metres	1MHz
10 metres	1500 KHz
12 metres	200kHz
15 metres	entire band
17 metres	200kHz
20 metres	entire band
30 metres	entire band
40 metres	280 KHz
80/75 m.	40 to 100 KHz
SWR at resonance:	≤1.5:1
Power handling:	1.5kW
Feed impedance:	50Ω
Wind load:	.49m²
Wind survival:	129kph
Height:	7.9m
Weight (HF6VX)	5.4kg



For gain where you really didn't think it was possible! The BUTTERNUT HF5B "Butterfly" beam is designed for those locations where just about any other rotatable antenna won't fit. This compact beam uses no messy traps and can be turned with a small rotator. High quality stainless stell hardware is used throughout to ensure your HF5B will last.

HF5B specifications:

Bandwidth for <2:1 VSWR:-

10 metres	1500kHz
12,15,17m	entire band
SWR at resonance:	≤1.5:1
Gain:-	
10 metres	5dBd
12 metres	5dBd
15 metres	5dBd
17 metres	0dBd
20 metres	3dBd
Front to back ratio:	20dB
Front to side ration:	30dB
Power handling:	1kW
Feed impedance:	50Ω
Wingspan:	3.84m
Boom length:	1.83m
Turning radius:	2.12m
Vertical spreaders:	1.83m

For many years the Butternut company ha been famous for producing high quality antennas that **REALLY WORK**! The entir Butternut range is now on stock at Daycom immediate delivery. If you are short of spa or just want to join the thousands of satisfi amateurs using a Butternut then call us no

BN-HF2V	2 band vertical 80 & 40m	$4
BN-30MRK	30m kit for HF-2V	$1
BN-TLK	Top loading kit for HF-2V	$
BN-TBR160S	160m option kit	$1
BN-HF6VX	6 band 80-10m vertical	$4
BN-HF9VX	9 band 80-6m vertical	$5
BN-A1712	17/12m add-on (HF6VX)	$1
BN-A6	6m add-on (HF6VX)	$
BN-TBR160S	160m add-on (either)	$1
BN-CPK	Counterpoise kit (either)	$1
BN-STR2	Stub tuned radial kit (either)	$1
BN-RMK2	Roof mount kit (either)	$1
BN-HF5B	5 band 20-10m mini-beam	$6

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MFJ Antenna Tuners

901B	200W Versatuner	$135
910	Mobile antenna matcher	$42.70
921	2 mtr 300W tuner	$154
924	70 cm 300W tuner	$154
931	Artificial ground tuner	$176

941E 300W compact GP tuner $247

945D 300W mobile tuner $198
948 Deluxe 300W (no D/L) $292

949E Deluxe 300W $337
962C 1.5kW tapped inductor $520

971 200W Portable tuner $203
986 3kW Diff-T roller inductor $652

989C 3kW Deluxe roller inductor $785

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MFJ498 32K Morse keyboard & display **$399**

MFJ452 **'Super CW Keyboard'** has all of the features of the MFJ498 plus a two line LCD display. Nonvolatile memory stores all messages and settings. Commands can be stored in messages.

MFJ452 Morse keyboard with display **$289**

The MFJ451 stand-alone keyboard has a 200 character type-ahead buffer and two 100 character message memories.

MFJ451 Morse code keyboard **$195**

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ICOM W21A dual band hand-held, very last few available now for an amazing **$499**

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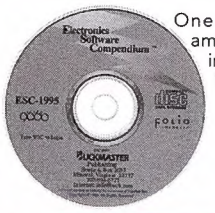
$80 inc postage



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Super-LOOP

The MFJ1786 loop is fully welded from aluminium tube for better Q, lower losses and reduced microphonics. Ideal for portable operation, flat dwellers, caravan parks or anywhere space is limited. Needs no radials, counterpoise or antenna tuner. MFJ's Super Hi-Q Loop is remotely tuned, but needs no control cable, everything is carried on the coax! Remote control unit for operation from 12V DC or internal battery supplied.

- Small, only 915mm diameter
- Tubular radiator for better performance
- VERY quiet receiving antenna
- Remote controller supplied
- Built-in crossed needle SWR/Power meter
- DC powered for convenience

MFJ1786 10-30MHz continuous coverage loop ~~$625~~

This month only: $525!

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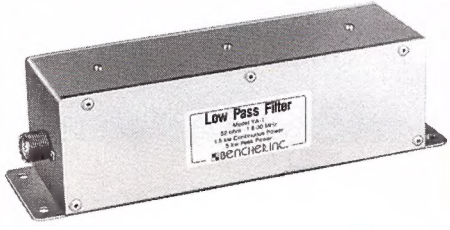

MT093 Bencher Lowpass filter **$109**

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- Powerful 100 W from HF to 50 MHz and 10 W for 144 MHz
- 101 memory channels with dotmatrix display
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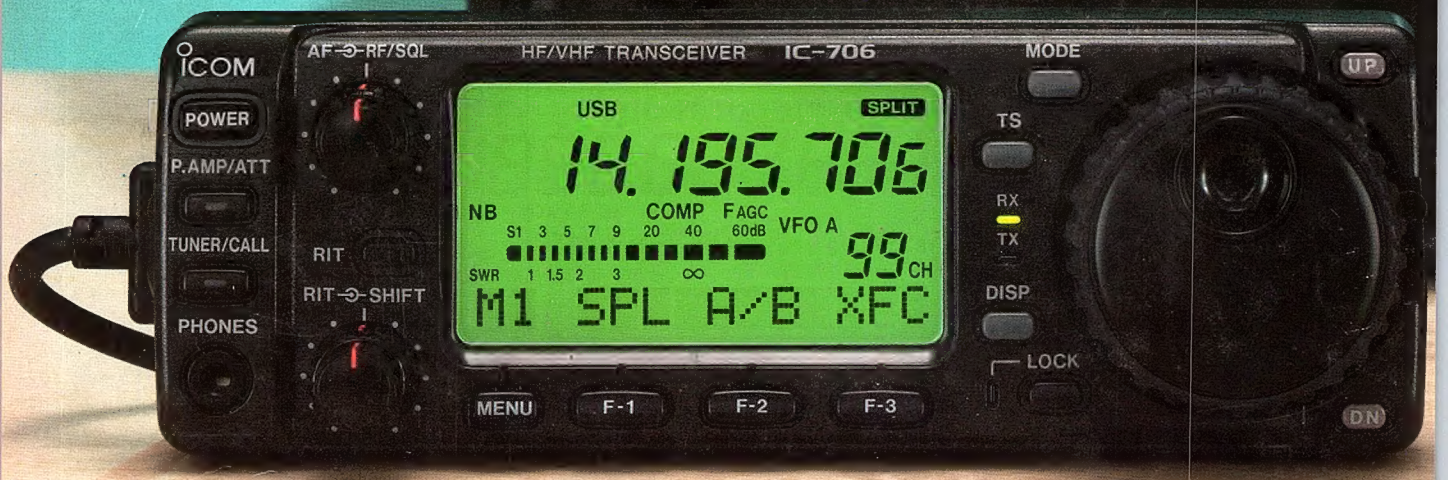
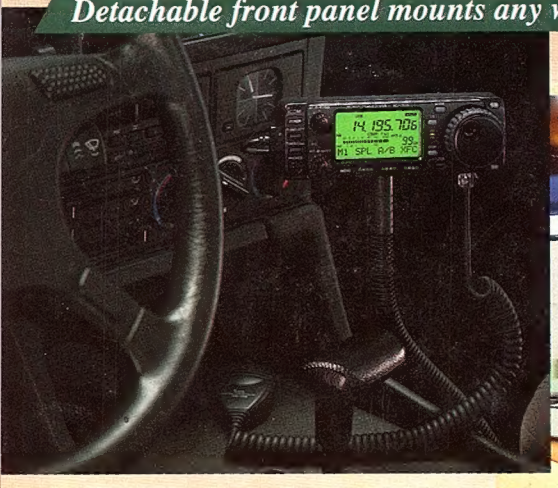


Detachable front panel mounts any where.



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